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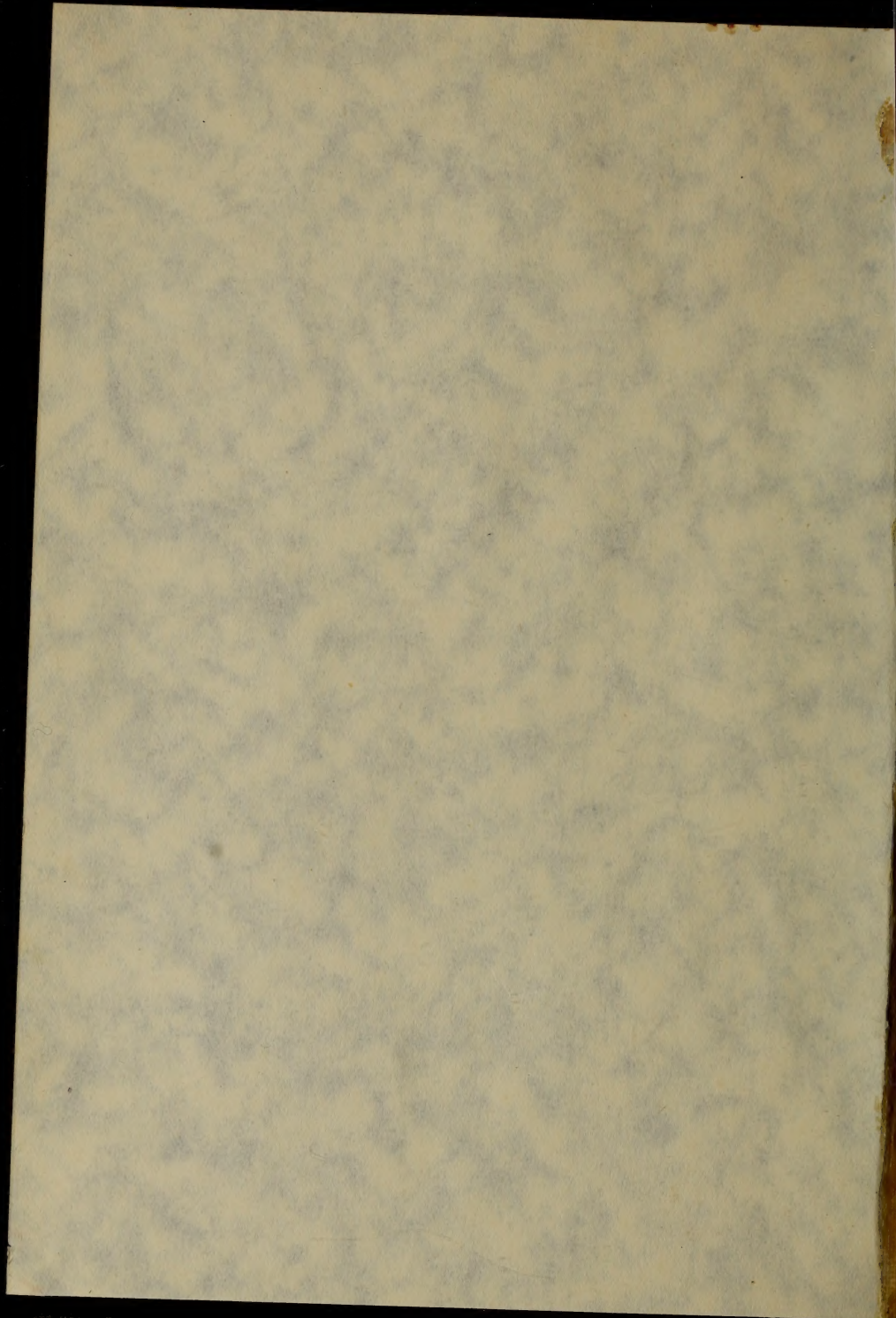














# GREAT LAKES TECHNOCRAT

R. S. CAMERON

25c

JANUARY-FEBRUARY, 1944

25c

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# GREAT LAKES TECHNOCRAT

JANUARY-FEBRUARY, 1944 ★ VOL. II ★ No. 8 ★ WHOLE NO. 65

★ Illustrating the Futility of Price System Methods of Operation; Interpreting the Trend of Events from the Social Aspect of Science; and Presenting the Specifications for Total Victory in America's War Against Fascism. ★

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# War-Time Chiseling A La 'Free Enterprise'

by R. F. Novalis

## Three Deadly Parallels

### Fat War Profits

Profits, over taxes, of all corporations during defense and war production years of 1941-42-43 are estimated at \$24.2 billions, by Randolph Paul, general counsel of the Treasury Department. Of this, \$19 billions were made in war materiel contracts. First quarter profits of all corporations this year, after taxes, were 18 percent above 1942 first quarter levels.—U. S. Dept. Commerce.

### Slim War Industry Operations

America's Railroads—37% of freight cars moved are empties; 48% of passenger car seats unoccupied. America's steel mills—operating at estimated 43% of potential capacity. America's 250 largest war-plant contractors admit only 16% of them now at capacity operations!

### Growing War Casualties

Washington, Nov. 11, 1943 —Total Casualties to United States forces since Dec. 7, 1941, numbered today 121,000. This includes 25,389 dead. . . The coming European offensive may bring losses 'so heavy that they will be felt in every town and every village in the United States,' warned Maj. Gen. George V. Strong, Asst. Chief of Army Intelligence.

**L**AST February the WPB, made up almost entirely of business men, admitted that 70 percent of all war contracts were in the hands of 100 manufacturing corporations. That month Senator Harry Truman said:

The largest business monopoly in the history of the world has been created in the War and Navy Departments and the WPB. It has placed thousands of its representatives in key positions in Washington, so that today, the purchasing power of our government is funneled into the big corporations.

This situation was virtually unchanged this September, when Col-

\*Note: Italics Ours.

onel Bryan Houston, now OPA Deputy Administrator, stated in Chicago that 85 percent of all war contracts were held by 400 manufacturing corporations.\*

The corporations have made \$19 billion clear profits out of the war so far, but even if they were motivated by the highest patriotism they could not have operated America's technology at the high order of efficiency called for to achieve victory sooner—much sooner than it will be achieved. The fact that our productive capacity has not operated at full efficiency, and why, is shown by an investigation, of the facts.

\* Note that the 400 largest corporations of the country normally get almost 20 percent of all profits after taxes, and that 20,000 people are paid 33 per cent of all dividends issued.

This much is certain, that business was not deprived of the opportunity to go 'all out' in achieving the maximum efficiency in the war effort. It was, on the contrary, given every opportunity to do so. Industrially, this was unavoidable, for the corporations have most of the technology of the country, in an extremely uncoordinated form. Financially and administratively it was not necessary, indeed almost calamitous, to give business carte blanche in producing America's requirements for war under the anarchic methods of business-as-usual at a profit. Here is a partial record of industry's 'war effort.'

### *Is 16 percent Good Enough for America?*

The most amazing industrial news of the war was contained in the Sept. 1943 issue of *Mill & Factory*, a magazine published by and for corporate industry:

*A telegraphic survey of the nation's 250 largest prime contractors holding the bulk of America's war production, shows that only 16 percent are operating at full capacity.\**

The plants working all-out-capacity do number in the thousands but these represent only the small factory and garage subcontractors, whose contribution, however necessary in some cases, is trifling compared with the total output needed or delivered.

At the same time the September

issue of two other business magazines, *Steel* and *Iron Age*, revealed that \$1 billion worth of brand new machinery and equipment, numbering 55,000 types, has not yet been installed. Of this number, 10,000 are machine tools. Here are some examples of the war 'efficiency' of the system of 'free enterprise':

### *Railroads*

'The railroads are carrying about all the traffic they can handle.' Leonard Ayres, economist and vice president of the Cleveland Trust Company, Sept. 15, 1943.

The nation's 1,700,000 freight cars are carrying 2,000,000,000 ton-miles of goods daily, mostly war materiel, at 'capacity.' What is their capacity, though? Even the American Association of Railroads' Car Service Division admits that 37 percent of freight car mileage is empty, (9/43). What is more, one-fifth of the average loaded car's capacity is not being used, also from A.A.R. data. And last March, only 52 percent of railroad passenger-car capacity was used. (Interstate Commerce Commission). *Steel*

Last January the Division of Information of the WPB stated that iron and steel plants were utilizing their productive equipment only 71 hours a week, or 42 percent of potential capacity based on the 168 hours in a week. At that time the American Iron and Steel Institute said the industry was 'at 97 percent' of capacity. By August it had advanced only to '98 percent,' so the mills' ma-

\* 'Capacity' was defined as being the point at which it is impossible to increase production.



chinery is *still* idle more than half the time.

### Coal—Electricity—Airplanes

The nation's bituminous coal mines were operated last year at only 72 percent of their capacity figures, on a 365-day year basis.

The electric power stations produced 188 billion kilowatt-hours, when on a 365-day basis (theoretical because only .90 or .95 is practical) generation would have been 405 billion kw-hrs, or 54 percent more.

In October 1942, nearly a year after Pearl Harbor, U. S. air frame factories were operating their production equipment only 91.4 hours a week (out of 168 available hours), according to the WPB.

### All Industry

The Business Trend: Getting Tougher as Operations Near Capacity. *Steel Magazine*, Sept. 13, 1943.

Industry Appears to Have Reached the Saturation Point of Its Productive Capacity. Leonard Ayres, Sept. 13, 1943.

Output Ceiling Believed Near. The country is approaching the ceiling of its productive capacity, the National City Bank of New York reports in its monthly letter. *Chicago Sun*, Oct. 5, 1943.

The above were buried in the financial pages of the daily newspapers, while simultaneously front pages carried accounts of the first big land battle between Allied and German forces in Italy, as well as quotations from war agency officials stating that *more*, not less, fighting

equipment will be needed from now on to drive the war into our enemy's homeland.

In spite of WPB's exhortations, war production is leveling off. In July 1943, it faltered and fell behind its schedules *for the third consecutive month*. To experts that means it is pushing against a ceiling. This ceiling threatens to come 6 months sooner than WPB expected. If it comes, *it will clamp a lid on output about 20 percent or more below the peak rate which present plans demand*. *Business Week*, 8/14/43.

Again in Sept. 1943 business failed to measure up to its 'responsibilities' for Charles E. Wilson, acting WPB chairman, was quoted in the October 28 *Iron Age* as saying: 'September overall munitions production was approximately the same as for August and cannot be regarded as anything but disappointing.'

A few months ago the problem became so serious that officials began making appeals openly to the public at large. Lt. Gen. Brehon Somervell, Chief of the Army Special Services, said in July that 1943 production schedules will not be met and the army will not be completely equipped until mid-1944. In fact, he said, total army goals for 1943 had to be cut 25 percent; airplane output alone will be 20 percent less than asked for.

In his speech of Sept. 21, 1943, Prime Minister Churchill revealed

that the invasion of Italy was *delayed 40 days* because of the difficulty of assembling enough ships and landing craft.

So far we have been extraordinarily fortunate, but even so the losses represent a serious problem. The weapons and equipment in battle must be replaced immediately without delay if the advance is to continue and if we are to give the soldiers who depend on these weapons a fair break on the battlefield. There will be no end to these requirements for weapons until the last battle is victoriously completed. — Gen. George C. Marshall, 9/23/43.

#### *Reserved Seats On the National 'Gravy Train'*

What is 'free enterprise' getting out of this war? That is, out of the \$124 billions spent by the U.S. Government for military purposes since July 1940? In the three World War I years, 1916-17-18, American corporations made a clear profit of \$17½ billions (National Bureau of Economic Research figures). The peak was in 1917 with \$6.7 billions profits after taxes.

Based on present trends of profits, after taxes (The Dept. of Commerce estimates that) American corporate profits for 1943 will reach the all-time peak of 8.4 billions. This is higher than the bonanza year of 1942 and 1941, despite increasingly high taxes. What is more remarkable, it indicates that cor-

poration profits, after taxes, will be higher in the middle of a world war in which casualties are accelerating, than they were in the all-time boom year of peace, 1929 . . . 7.9 billion dollars after taxes. Corporation profits made in the piping days of peace are going to be overtopped by corporation profits made in the dark days of war. *Christian Science Monitor*, 9/27/43.

Some business men have claimed that 'in general' business is not making unfair profits out of *this* war. 'Net (after taxes) profits of all corporations last year was 83.2 percent higher than in the last peacetime year 1939.' James F. Byrnes, WMD, 8/16/43.

'*I don't want much profits,*' said Edward G. Budd, President of the Budd Mfg. Corp. on Sept. 24, 1943, at a House Ways & Means Committee hearing. Admitting his total salary and bonus, which had been \$85,000 in 1939, was \$205,000 in 1942, Mr. Budd asserted that 'manufacturers would be ashamed to take excessive profits.'

The American Car & Foundry Co., averaged \$72,000 profit a year between 1936 and 1939, but from its war contracts and other business in 1942, its profits after taxes were \$7,000,000 an increase of 9,700 percent. The American Locomotive Company had profits the first 6 months of 1943 nearly as large as all of 1942's, and the latter was five times its 1936-39 average.



Even the National Association of Manufacturers recognizes that Americans might recall that 21,000 new millionaires were made in the last war. Its surveys have found that 70 percent of the public has the strange idea that 'extravagant profits are being made out of the national emergency.' The Association is rectifying this situation by way of a booklet, 'How to Prevent Misinterpretation of Your Profits,' provided for its members.

We find salaries going up from \$5,000 and \$10,000 to \$100,000, and the men who get them think they are worth it, said Undersecretary Patterson, at a House Hearing Sept. 21st. But I say the soldiers are serving for \$50 a month. If that be demagoguery, make the most of it.

The following frank editorial quotations were found in the Sept. 15, 1943 issue of *Modern Industry*, a monthly business publication:

... Recognition begins to appear in Washington of the importance of the profit motive in obtaining maximum war production ... *a greater incentive than patriotism is needed*, and the best incentive in prospect is the old American-proved hope of profit and freedom of initiative.

Well-meaning attempts to 'curb' profits in wartime, such as the 170 bills up before Congress in the past 25 years, are futile. As long as business operates, it will continue to make profits, otherwise it will not operate

as business. The record shows that private enterprise has done very well out of the war. It has proven its fiscal efficiency, to its stockholders. The mere fact of profits, however, is immaterial, except inasmuch as the citizens of America and their children's children will be billed to pay for these profits. The important thing is the resulting productive record, the technological efficiency, the conservation, and restriction of waste. *Profits or no profits, can America continue to operate its economy this way under the increasing strain of the war and the coming crisis of the peace?*  
*Interference with Flow Lines*  
*is Treason*

Outright frauds by some of the largest war contractors have been minimized as 'merely isolated examples,' but the fact that even one of these corporations pleads guilty is an indictment of the system which makes such things possible. *More than 1000 cases* are being investigated by the Department of Justice (*Christian Science Monitor*, 10/20/43).

A 'bill of particulars' filed Sept. 7, 1943, in a Kansas City court, according to an exclusive story in the *Chicago Herald-American*, contains, among others, the following charges concerning the Sunflower Ordnance plant at Eudora, Kansas, charges made by a former chief construction inspector and by FBI agents: 150 truckloads of lumber were burned *daily* in a pit, over a seven-month period, although the wood was pur-

chased for construction purposes. A thousand tons of iron pipe, costing \$100,000 was buried '*for the sole purpose of destroying it.*' Upward of 1000 employes a day were permitted to work on the project while drunk. Barricades 30 feet high and 8 feet deep were to be built of screened earth to take up shocks in case of explosions in powder houses. They were instead built of cornstalks, weeds, scrap wood and other waste materiel, 'thereby defrauding the government of \$810,000 and menacing the lives of plant employes.'

The 10 contractors were paid \$30,000,000 over the original cost estimate of \$81 millions. (For this every man, woman and child in the U.S. contributed 23 cents out of their war bonds and taxes.) These men could not be said to be in the pay of Hitler or Tojo; they were merely exercising their initiative to chisel, an initiative denied men conscripted to serve their country in the army and navy.

Cleveland, Oct. 11 (UP)—Federal Judge Emerich B. Freed . . . imposed 10-year prison sentence and fines of \$10,000 each today on three former officials, the Schmeller Brothers, John L., Frank and Edward, of the National Bronze & Aluminum Company, one of the world's largest producers of aluminum castings. The men were found guilty last week of war plant sabotage and by the court's action became the first war plant manufacturers to be sentenced for violating the

Federal Anti-Sabotage Act during the present war.

More than 100 witnesses testified for the Government against the officials, according to *Time*, Oct. 18.

When suspicious Packard officials rejected \$130,000 worth of castings and ordered them scrapped—after repeated warnings to National Bronze that defective parts would kill U.S. flyers, the *Time* article states, the company patched up the parts, charged the serial numbers, and shipped them back to Packard as new parts . . . the reason for the plot: National Bronze got \$2.70 a pound for accepted castings but only 15c for those scrapped.

Actually, the biggest case of fraud against our soldiers and sailors and fliers is the fact that *only 16 percent of the biggest war production plants are working at their admitted capacity*, in this, the world's greatest technological nation, engaged in total, technological war.

### *The Civilian Gets It In The Neck Too*

Since Pearl Harbor, destruction by fire in the U.S. has been comparable to destruction by Nazi bombs over England in two years, according to Chief Fire Marshall Anthony J. Mullaney of Chicago (10/4/43). In 1942 there were more than 200,000 separate forest fires in the U.S., burning up more than 31,000,000 acres of forests—equal in area to the entire state of Louisiana!

In this kind, Christian nation that has more saloons than public schools



and spends a billion dollars more every year for liquor than it does for education, more citizens have been killed on our public highways and in factories and homes *since September 1939*, than in all our wars put together.

The largest number of 'absentees' in the country are those *not* in war plants, but those still working in banks and stock markets (925,000 in finance and similar occupations, of which 215,000 are in the insurance game), 10,500 in perfume and cosmetic factories, 16,500 manufacturing *curtains*, 17,000 making jewelry, as well as those 'absent' from war production in theatre ticket agencies, gambling houses, racetracks, night clubs, parking lots, saloons, and the organized 'dives' of the underworld. Most of them are not even essential to the civilian population.

Other causes for lessened effectiveness of the manpower we have are accidents and sickness, not strikes, which have caused only 2/100ths of one percent of man days lost on army contracts, according to James P. Mitchell, Labor Relations Director of the War Dept. These are some examples of the crying need for co-ordination of *all our resources* under the direct control and planning of the United States Government. Since its first public statement to that effect back in July, 1940, Technocracy has noted many prominent Americans making similar proposals.

#### *If You Build a House On Sand*

It is going to take the combined brains of all the scientists,

the engineers, and the business men in the United States and the united nations, just to survive. Never mind business as usual. Never mind the good old days. The fate of civilization is going to be determined for literally thousands of years by what you and I do—*not what the army and navy does*—in our homes, our factories, and in our offices, because the fighting line today starts at the production line. Col. James L. Walsh, chairman of War Production Committee, Society of Mechanical Engineers (1/28/43).

Contrary to general belief there is more good organizational talent to be found in government than in business. Washington is frequently referred to as a "mad-house." It would be madder yet if there were more business men there. Henry S. Dennison, nationally known Boston business man, *Aircraft Bulletin*, 9/27/43.

Total war demands that our vast economic system be operated along the organizational lines of a single industrial plant. Sen. Harley M. Kilgore, 2/22/43.

Contrary to this are the undercover maneuverings to conscript only labor as another scheme to cover up the mistakes of business. The smoke screen is laid down by magnifying the so-called manpower 'shortage' and ignoring manpower *wastage*, as well as materiel and money and time waste in profits, fraud and low output. Current proposals to conscript labor

alone are the first steps of institutional fascism in America.

It is not only a matter of morale and unity, not only the slavery of fascism. It comes down to a problem of war operations and the perilous postwar period. Since industry is the source of all supply for the armed forces and the civilian population, its control cannot much longer continue to be left uncoordinated and unplanned. All industry must be conscripted simultaneously, as thousands of Americans are demanding.

### *Let's See What The Score Is*

What is the cause behind all these shortages, idle equipment, blood money profits and industrial sabotage?

The answer lies in the system itself, the Price System, with its mechanism of business enterprise; producing less than is needed; holding back new productive capacity; producing inferior equipment; delivering commercial-type equipment to our forces fighting a 400 mile-per-hour war; and hoarding materiel and manpower. Technocracy does not maintain that this situation is caused by deliberate intent on the part of the owners and management of business. If it were by deliberate intent, it would be less dangerous than it is. This condition is produced by habituated action patterns. They have become so used to making motions with their left hand that they cannot use both hands when it becomes necessary to do so.

Production for the needs of the armed forces has been consistently

underestimated since as far back as January 1941 to say nothing of the point-blank refusal to accept defense contracts before that time because of the 8 percent profit limitation of the Vinson-Trammell Act, now scrapped.

The United Nations, chiefly on the gigantic battlefields of Russia, are winning the military conflict. America, as one of the United Nations, will be on the winning side. But let us not forget that this was accomplished so far *without* the complete mobilization of America, *without* planned direction of the national totality as an operating unit. America's contribution to victory comes from its array of technological equipment and its technological skill. The haphazard anarchy of the unplanned methods of free enterprise have been a constant drag upon the efficiency of the national effort, have hindered America's contribution to victory, have prolonged the war, and are a red signal of danger to the stability of the peace.

America, as a technological mechanism, cannot be operated in either war or peace at the peak of efficiency by individualized, voluntary, hit-and-miss effort. When military victory is finally achieved, it will be in spite of corporate business, free enterprise, and price-and-profit operations, not because of them. It is evident that we cannot win the peace either with such controls. The peace, with 18 to 30 million unemployed in America will be a greater crisis than the war.

Business is in charge of America's war effort. Business was in charge of America's war against the depres-



sion, and it lost that war. Now it hopes to attain a victory over the social changes of the future by maintaining business-as-usual after the war to distribute the abundance of America's new technology.

But the pitcher has gone to the well too often. The American Price System of commerce and industry has outlived its natural growth curve. For the last 20 odd years, it has been held up only by the strong arm of Government. The advance of science and technology now makes imperative the scrapping of anarchic privileged individualism in the fields of production and distribution of physical goods and services.

Technocracy's survey of the North American Continent indicated these facts years ago. While industrial and social chaos was deepening over this great land. Technocracy was quietly preparing a scientific blueprint of national operations for defense, security and abundance. The American people

have been sedulously protected from this information by a reversal of the self-proclaimed historic function of the Press. But there comes a day. 'Mightier than an army is an idea whose time has arrived.'

*The technological structure of America demands that we Americans abandon the haphazard conflict of private and group interest in order that we may win this war and thereby defeat the enemies of America (without and within) and win the peace for America.*

Americans it's up to you whether you want profits or patriotism. Do you still think we can solve America's problems with money and machinations alone?

**Technocracy proposes Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None!**

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### **Climate of Opinion**

Stating that America is entering a 'peaceful revolution' which will change the motive of our system from private profit and scarcity to one of abundance based on human needs, Murray D. Lincoln, secretary of the Ohio Farm Bureau Federation, asserted that:

'If this war has done nothing else it has thrown into bold relief the direction we are going. It has crystallized the hunger and determina-

tion of the great mass of American people for abundance and security.' *Chicago Sun* (UP), 11/18/43.

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'It is nothing short of treason to waste time now on post-war production plans, when American boys are dying on battle fronts all over the world.' John B. Hawley, head of Northern Pump Co., Minneapolis, (*Chicago Herald - American*, 9/15/43).

# After Me You're First

by Alice Anderson

Maj. Alexander de Seversky (in December 1943 *American Mercury*)

'Aeronautical science today makes it possible for us to strike directly from American soil at the enemy's industrial war-making heart with long range aviation' . . . 'from bases on the North American Continent.

'With range and aiming controlled by new scientific devices, these great bombers will be able to destroy attacking planes before these come within the effective range of guns and rocket torpedoes, and thus will be well nigh impervious to fighter plane attacks.

'Long range power . . . is in character with our National genius which is technological. Our long suit after all, is not manpower and bayonets—China, Russia, and India for instance, have a great preponderance over us in this respect; our strength resides in industry, science, technological prowess.'

General Oliver P. Echols, U.S.A. quoted in *New York Times* December 31, 1942.

'If the war requires' we can construct planes which 'could carry bomb loads of more than 25 tons and have a range of more than 15,000 miles.'

Probably the most startling and realistic book on aviation in this war since DeSeversky's 'Victory Through

Air Power' is a new volume called 'Vertical Warfare' by Francis Vivian Drake. From the title it can be seen that the author, a flier with the RAF in the last war, has a functional purpose in mind for airpower, not a fanciful one.

Drake's thesis is that the Allies could destroy 40 percent of Germany's industrial power if they can drop 240,000 tons of bombs in that area over a 4 to 6 month period.

Howard Scott, Director-in-Chief, Technocracy Inc. in November 1941 *Technocracy*.

' . . . from these bases (surrounding this Continent) the attack could be carried by the Flying Wings to almost all parts of the world—right to the home front of any potential enemy of this Continent.

'It (the Flying Wing bomber of Technocracy's design) will have a unique and deadly armament, so deadly that it will blow any existing fighters out of the sky before they get within their own range.

'America has the technological skill and the facilities to make the great aeronautical advance required in producing these planes. No other country has the technological capacity to produce a plane of such size in quantity.

'The final downfall of naval power only awaits that day when some coun-

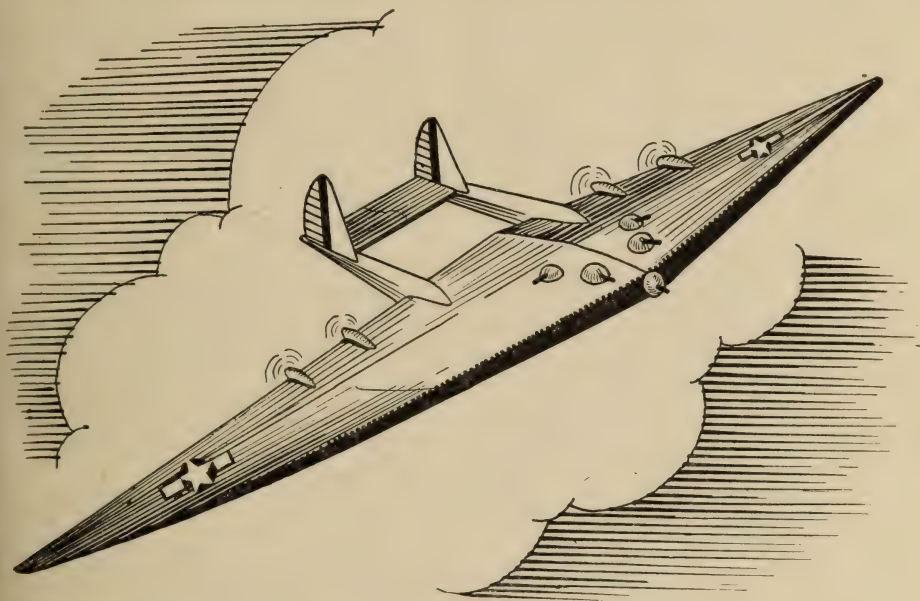


try does produce fleets of bombers having 6000 miles or more range and carrying 25 to 50 tons of bombs each.'

Three weeks before Pearl Harbor Technocracy first publicly described its design for a Flying Wing type bomber which, in stated quantities, could deliver from the air a total of

275,000 tons of bombs and other explosives over *any* fascist target, obliterating it completely in a single trip. (See 'Technocracy' magazine, A-21, November 1941.)

The aim being to win the war in a minimum of time, with a minimum of losses to our forces, we are learning that *it cannot be done without the maximum of equipment.*



## WINGS OF THE CONTINENT SYMBOLIZE

Victory through air, land and sea power.  
Victory in the shortest time at the lowest cost.  
Victory without debt, price or profit.  
Victory over post-war problems to come.  
Victory over fascism at home as well as abroad.  
Victory through science, technology and design.  
Victory for America by American methods.

# 'Sharps and Flats'

by Robert M. Yoder

Reprinted by Permission of *The Chicago Daily News*  
November 15, 1943

Unless the generals have hearts as hard as stone they will not end the war without giving at least a week's notice to the warriors of the New York Stock Exchange for life on that front has been rugged in the extreme and one more shock might do for them.

It is true that the market 'rallied moderately,' as the *United Press* reported, on Prime Minister Churchill's solemn warning on Nov. 9 that the bloodiest fighting of the war lies ahead, with the greatest sacrifices of American and English lives, but for a solid week before that the district around Broad and Wall sts., had been knee deep in gloom.

There was a \$2,000,000,000 slump on Monday, Nov. 8, on the gloomy news that London was betting on an armistice by Christmas, and the slump followed what was called the worst week since the news came that Mussolini had lammed. 'Peace Psychology' said the stories on Saturday, Nov. 6, 'received the principal blame for the relapse. The successful Moscow conference, the persistent Russian victories over the Nazis in the Ukraine, the Allied advance in Italy and the unceasing bombing of the Reich brought the thought that Germany could blow up overnight.'

There wasn't a piece of bad news anywhere, you see, just unrelieved

success for our side, which is very, very bad for the market. It had been worry, worry, worry, all week long.

Douglas Aircraft touched the lowest point of the whole year, so did Dow Chemical. United Aircraft was at least soft and so was U.S. Rubber. About the only real bright spot in this whole disturbing week was American Distilling. Even with pessimism a foot deep, and the clouds of peace growing blacker every minute, whisky held its ground. Held, nothing, it climbed six and a quarter points. The boys may have been badly discouraged about prospects that the war would last, they may have been depressed about the future of aircraft and chemicals, but they had confidence that the nation is not going on the wagon.

It would be nice to think they made up their losses on munitions by a profit in booze, but that is too much to hope, and undoubtedly a good many investors took a bad loss that dark week, and perhaps some of the traders, too.

Is that what we are fighting for, or if not fighting, paying taxes for? Are we going to defeat Fascism only to produce a nasty break in the New York stock market? What a hollow victory that would be, what a mockery. What irony—to save free enterprise and lose money on Armistice Day.

There will be more good news, that has to be expected. We cannot count on the Russians to slow down; what do those Communists care how U. S. Rubber closes? This winter undoubtedly will bring further bombing of the Reich, too, in spite of its proven bad effect on some of our best known

securities. There may be further political successes, too, like the costly day when Mussolini toppled. And in time there may be another invasion of Europe. It is sickening to think what that might do to the stock market. After that, they should have a furlough.

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### **Tokio Broadcasting**

Michio Ito, a repatriated Japanese broadcasting for propaganda purposes to the Japanese people recently, had the following to say about the United States, according to a report by Harold Ettlinger in the *Chicago Sun*, November 26, 1943:

It is true that our enemy, the United States, . . . is desperately carrying out her counter-attacks by depending upon her rich material resources. . . . However, the United States also has many weak points. If I should speak of the American people based upon my observation of them . . . the first weak point I say is the democratic system. . . . Public opinion lacks unity.

There is 'lack of unified relationships' among governmental departments. There is a 'festive mood of

the people who do not know what war is.' There is 'no plan for certain victory—but instead the desire for luxury is more dominant in their minds.'

But nevertheless, we're going to lick the hell out of Oriental fascism. Technocracy is well aware of America's weaknesses, but they're not what you imagine they are, Ito. The technology of America will prevail over the human toil and hand tools of fascism. The great technology of America needs unification and positive direction. This can and will only be accomplished by Technocracy's design of Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None. Perhaps you hadn't heard about this, Ito. So sorry! Excuse it please.

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One frequently sees references in print about business men in which they are referred to as hardheaded executives, etc. This description is supposed to be a compliment, for the 'free press' of America seldom makes derogatory remarks about business. We wonder if the press knows the commonly accepted definition of a

hardhead? It is given in Webster's dictionary as 'a shrewd unfeeling person, a blockhead.'

We know of another definition that seems to fit well. 'A hard-head is a person into whose head it is hard to get a new idea, especially if it interferes with his private privilege to chisel at public expense.'



# High: Low: Close

by W. T. House

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**Most American industrial establishments of consequence began in a small way under individual or partnership ownership; or else as joint stock companies. Shares were sold directly to the public without having been listed on the Stock Exchange. The money obtained was mostly used to expand the plant and securities speculation was rare.**

**The greater part of all investment in this country since 1900 has gone into pure paper. Stocks and bonds are fed into the Stock Exchange and sold to the public, the proceeds usually going to insiders and not into new plants. Whatever social function the Stock Exchange may have performed in the past—well that's in the past now.**

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Did you lose your overcoat in the Stock Market bump and are you now shivering at the thought you may lose your shirt as well? The devotees wail that the better the war news gets, the lower drop the prices. 'How can that be?' they cry, 'London went up on good news; why don't our markets do the same?'

Unbeknown to the thousands who read the ticker tape and read little else, there is a fundamental difference. Those small bits of land called the British Isles have few natural resources but a huge population. Its people must, therefore, live in a scarcity economy, with little probability of achieving the more abundant life. For them, then, the end of the war means that profit restrictions will be lifted from good old private enterprise, shares in companies will therefore sell at higher prices on their Stock Market.

On this North American Continent,

however, even before the war, we had installed so many power machines that we could produce goods much faster than we could find Price System markets for them. During the war, we have installed enough newer and more efficient power machines so that we can produce about twice as much goods. The reaction in the business world is equivalent to offering another ice cream cone to the four-year old who has already had one too many cones. Unless business can find a way to destroy that potential abundance, it sees thousands of bankruptcies coming, even before the end of the war. Business is thus uncertain of its future and this is reflected in the Stock Market; and in judging the strength of that uncertainty one must bear in mind that the growing inflation is a strong force trying to push prices up. The indications are that it is time to sell business 'short.'

Impatient, you ask a question: 'How does the Stock Market help to win the war?' Frankly, I don't know a single argument in its favor from that point of view; yet in Canada at least it is classed as essential and we are now only talking about making the employes of brokerage houses subject to compulsory transfer to war jobs—and this in the fifth year of war. The attention and activity of thousands of people are centered in this branch of business, the only part useful even to a Price System war effort being that some of the salesmen sell

bonds in the Victory Loan drives—for a commission, dollar patriotism.

Whether the government will divert this activity for profits into productive war work through Total Conscription of Men, Machines, Materiel and Money, remains to be seen. If the government does not act, and if the trend to business uncertainty continues, the financial pages of our newspapers may have written in brief already, the story of all business as well as the Stock Market:—HIGH: LOW: CLOSE.

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### **High Cost of High Finance**

John D. Rockefeller recently called off his proposed sale of \$25,000,000 in stocks in commercial enterprises; he had planned to use the proceeds to buy war bonds. One explanation, offered on the *Chicago Daily News* financial page, was the expense 'involved just getting rid of the 25 million dollars worth of pieces of paper.

'It is probable that a matter of some \$250,000 or more in printing and other expenses caused Rockefeller to change his mind. This estimate is based on the experience of one corporation engaged in a financing operation. The printing bill came to \$50,000 for the prospectus, while the preparation of the material therein took the time of a staff of 12 highly trained men for six weeks.' (Italics ours.)

And certain interests still claim there's a manpower 'shortage.' Here is just a sample of the manpower wastage of thousands of men and

women now at work in stock exchanges and in stock brokers' offices throughout the nation. Only Total Conscription can solve the manpower as well as industrial-power wastage existing in the face of total war.

Total Conscription would mean that no corporate monopoly could assume the attitude that it is making sacrifices in allowing expansion which might lead to overproduction after the war.

Total Conscription would enlist all business and all corporate wealth in the service of the nation for the duration of the war and six months thereafter.

Total Conscription would mean that we would not pile up any more new war debt, for on the very day such a program was installed, it would be impossible to increase the debt by one single dollar.



# Bureaucrats and Politicians

By Publications Division 8741-1

## *Item 1.*

12,000,000 persons may be put out of their jobs within 6 months after the war ends, according to the Bureau of Labor Statistics. The Bureau also pointed out that 'failure to set our economic house in order would make a sound foreign policy impossible,' and our continued refusal to deal with basic problems at home 'will eventually force us to the brink of another and more terrible war.'

## *Item 2.*

The Congress which is now flirting around with beautiful resolutions and post-war plans for the whole world is the same Congress which voted the extinction of the National Resources Planning Board which was engaged in formulating a program for post-war America.

## *Item 3.*

No less than 80 large mineral workings and 700 smaller mines in the rich Leadville mining district of Colorado are in process of being recovered from the grip of 10,000,000,000 gallons of impounded water, and restored to production because of action taken by the 'bureaucrats' of the Department of the Interior.

Some months ago engineers of the Bureau of Mines, following preliminary study and recommendations by the Geological Survey, made an analysis of possible drainage methods. A main tunnel 11,326 feet long and

two lateral tunnels totalling 5,856 feet in length will be bored to drain off water which has kept the district closed down since 1933.

The Leadville district comprises four principal mining areas with a potential output of 3,000,000 tons of zinc-lead ores and 1,000,000 tons of manganese ores for war use. The district has been periodically flooded and partially unwatered by expensive and inefficient pumping methods ever since 1899. Eventually, the problem became too big for 'free enterprise.' Due to conflicting property rights and general technical myopia, no overall plan was ever adopted. Now that America needs the fullest possible production of minerals, the Government is forced to act to supersede the property rights and picayune interests of 'free enterprise.' It will be noted that the action was initiated and will be carried out by the technical personnel and departments of the Government.

Oh, Yes! Congress did appropriate \$1,400,000 for the project after it had been urged and okayed by the Interior Department, the Geological Survey, the Bureau of Mines, the Zinc Division and the Mineral Resources Committee of the W.P.B., the Metals Reserve Company, the Board of Economic Warfare, the Office of Production Research and, almost unnecessary to add but enlightening to note, the Colorado Congressional delega-

tion and property owners and public officials of Colorado.

*Item 4.*

The political method of operations succeeded in reaching a new low point in Congress recently. A bill had been proposed to extend \$300,000,000 in Federal aid to schools throughout the nation. Numerous Southern Senators were supporting the measure and the outlook for its adoption was favorable.

However, Senator William Langer, Republican of North Dakota, threw in a nifty amendment to the bill which would have prohibited any racial discrimination in schools qualifying for Federal grants. The amendment was adopted by that august body, the United States Senate, 40 to 37, which ordered the bill back to a committee pigeonhole. There it will repose in innocuous desuetude, a dusty memento to racial animosity and political finagling.

Senator John H. Overton, Democrat of Louisiana, stated that the Langer amendment was 'an attempt to foist upon the states the concept of mixed schools for negroes and whites.' Other Southern Senators, who had supported the measure, declared that the anti-discrimination amendment had been sponsored by Langer because he knew that its adoption would compel them to turn against their own measure.

There's no doubt about it, that's

what is called political sagacity. Apparently the Southern Senators would rather continue to cherish their racial hates than promote the interests of their own white children.

*Note*

We hold no brief for that oftentimes conscientious and efficient type of public servant called a 'bureaucrat.' Neither have we got the axe out for the average politician. Nothing so homely and inefficient as that. We favor the tommygun of publicity for his breed.

The examples quoted above are fairly representative of the difference between the political approach to social problems and the sort of semi-scientific approach permitted, or possible, under the constant restrictions and interferences of political bodies.

Nothing better can be expected under the Price System. These examples illustrate a trend which is present, and growing, even within the restrictive confines of political government. It points up one thing. If you want to get things done right in a technical civilization, you must call in the technical men. The extent to which this is done and the degree of freedom from interference permitted them determines results, all other things being equal.

Politics, political sagacity and politicians belong in limbo along with the philosopher's stone of alchemy, the dunce cap of astrology and the dead departed glories of 'free enterprise.'

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**Brotherly Love**

Nowhere on earth can you find a friend so bubbling with brotherly

love as a politician who is a candidate for re-election.

# An American Soldier Looks At 'Shortages'

by Pvt. Arland R. Meade

## *Woodman Spare That Tree*

ON the last day of October 1943 the *Cincinnati Enquirer* used 157,500 square feet of newspaper to announce, in a paid advertisement, that there is a 'critical shortage' of paper.

The advertisement, 18 x 6 inches in a paper with a circulation of 210,000, carried in large print the words, 'There's a critical shortage of waste paper right now, and there's a critical shortage of manpower, too, in the vital paper industry!'

'Shortage' and 'waste' are words which signify a condition and a practice undesirable in war time, to say the least.

So, how does business, including the just-mentioned newspaper, cooperate to cut down waste to prevent shortage? On October 31, in a Sunday edition business used 13,807,500 square feet of newspaper, in the 'Enquirer' alone, for advertising goods available for sale—note: *goods available for sale*.

In a city and nation where stores are closing on every business street due to insufficient goods to sell and during a period when the remaining goods need, for the public interest, to be conserved during the war and six months thereafter, businessmen try to maintain profits and 'business as usual' to the last safety pin.

Then one of these same enterprises prints a plea to the public to save paper because 'paper is needed to make containers to keep supplies flowing to our armed forces.' Then business, presumably with its 'conscience' clean, writes advertisements, many of full-page size, to describe the breath-taking 'smartness' of some new dress creation—for only \$9.98.

Ladies, gentlemen and others: I wear an olive drab uniform which may or may not look 'smart,' but it is comfortable and it is serviceable. Furthermore, I may die in it and, if so, I prefer to die to preserve the best of America for Americans who are left and are to be, not for profits nor business as usual.

Only half the story of advertising waste in the newspaper selected as a typical example has been mentioned. In addition to the space used for display ads for goods to sell, nearly as much space was used for classified advertisements, political and military soliciting (as for WAC enlistments) and for jobs wanted or help needed. The latter has become a major user of our newsprint. While these types of advertising have some war effort function, these, too, can be abolished by an overall plan of mobilizing all American resources, men, machines, materiel and money.

It often seems that a man in the



armed forces feels his stake in the war effort more keenly than men who are not in. But no American can afford to let misuses of our resources, newsprint or other, continue, and advertising today is misuse of resources, both manpower and material.

### *One Gigantic Service of Supply*

The solution to this problem of waste is basic and simple. I get issued to me sufficient clothing for working or fighting and for all the dress-up necessary in wartime. No newsprint is used to 'sell me' on these items; I do not need to read advertisements nor look for 'bargains.'

Issued to me is sufficient food to maintain strength and health. I get prompt and good medical attention. I am transported to places I need to go when I must be there; I am sheltered wherever necessary.

Does the American civilian need or deserve less than that? Or more? And does he need to take time to peruse pages of paper-wasting advertisement? He does not!

Scientifically designed Total Conscription—it will not be total unless scientifically designed—will eliminate this useless expenditure of men and materiel and produce at the same time more efficient operation.

That part of our armed forces known as Services of Supply has set a precedent and a partial method for mass distribution of the supplies for

living and fighting a global war with material-consuming, mechanized armies.

There are also living and fighting to do on the home front. Total Conscription will install a vaster services of supplies to integrate the supplying of all Americans into one overall plan.

Newsboys will not be required to tote bundles of papers with 60 percent of their weight devoted to advertising; printing presses will be relieved of more than half their load; the pinch for manpower all along the paper and publishing front will disappear; men and women now devoting their time to advertising and other forms of salesmanship will be freed to produce and deliver materials serving to shorten the war.

This recital is an indication of what can be done in just one field of industry by installing a scientific plan of operation. When the same overall pattern of operations is applied to all industries a vast, new reservoir of manpower opens up. Conscription of labor alone is unnecessary and inadvisable in America. With personnel, materiel, machines and money, all conscripted and synchronized into an all-American Service of Supply, we will have such a multiplication of our national strength that the task of winning the war will be made much easier and the threat of post-war problems will cease to exist.

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The term 'free enterprise' really means laissez-faire enterprise, which

does not mean 'live and let live' as people suppose but 'leave us alone.'

# *The Bear That Fights Like a Man*

by Robert Bruce

## *America's Dark Hour*

In September 1863, the Russian Atlantic Fleet sailed into New York Harbor, under the command of Rear Admiral Lisovski. It consisted of three frigates, three clippers and two corvettes.

At that time Czarist Russia was in trouble with Poland, Britain and France. War seemed imminent and Russia needed friends.

The United States too was in trouble in September 1863. The tide of the Civil War had turned in favor of the North, and victory over the Confederacy seemed assured. But France and England were scheming to aid the declining Confederate fortunes by active intervention. The United States, too, needed friends.

The idea of sending the Russian Fleet to America was proposed by Admiral Popov. There were two good reasons for Russia's action. First, the Russian Atlantic Fleet could easily have been bottled up by England's Navy in the event of war. Second, if the Russian Fleet could get to a friendly foreign port, its potential ability to dart out and harass enemy shipping would make England and France think twice before declaring war on Russia.

There were likewise two good reasons why the North welcomed the Russian proposal. First, the presence of the Russian fleet in American waters would deter England and

France from declaring war on the North to help the South. Second, it would be a powerful psychological blow against the Confederacy.

Here was the flowing together of diverse interests into common action. Then, as now, Americans and Russians liked each other as individuals and respected each other's countries as powers, but detested each other's form of Government.

## *You Help Me and I'll Help You*

Russia sent the fleet primarily for its own strategic interests. The North also accepted the proposal primarily for strategic reasons. Out of these basic causes a friendly atmosphere arose. Czar Alexander 2nd, who had freed the serfs of Russia on the same day that Lincoln took the oath of office, was hailed throughout the North as 'emancipator of the serfs and friend of the Union.' On the other hand, Russia, too, acknowledged that the action of the North had been helpful to her.

Admiral Popov was in command of the Russian Pacific Fleet that sailed into San Francisco Bay in October 1863. Hearing a report that Southern cruisers were about to raid the Bay, he ordered his officers: 'If such a corsair puts into port, signal: "Put on steam and clear for action": We are bound to assist those who have offered us help.'

Russia and America had common interests in 1863. Today the common



interests of Russia and America are tenfold greater than they were 80 years ago. These entities are the two largest, contiguous Continental areas on earth. Regardless of their differences in political and economic ideologies, the physical problems and resources of the two areas are similar.

So far in World War number two, Russia has done the lion's share of the fighting against European fascism. In so doing she has been pulling America's chestnuts out of the fire. Lend-lease aid, in the words of Stalin — 'considerably facilitated the successes of our Summer campaign.'

Russian industrial development and military victories were not achieved by its political ideology. Neither have America's been achieved by its political ideology. In both cases it was done by the application of technology. North America is the Number One technological potential of the World. Soviet Russia is the Number Two technological potential of the World. They have much in common. For these reasons Technocracy has advocated a complete economic and military alliance with the U. S. S. R. for a number of years.

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### **Who's Who in Canada?**

#### *Finances*

Figures supplied by the Royal Bank of Canada indicate the following purchases in the Fourth Victory Loan there:

All Canada.....	\$1,308,985,500
Ontario .....	641,638,950
Quebec .....	360,696,600

#### *Enlistments*

The British section of Canada has supplied 35 percent of all its eligible males, but Quebec has supplied only 12 percent of its.

#### *Casualties*

According to John Mason Adams, a contributor to Letters in Newsweek for November 8, 1943, the casualty ratio in the R.C.A.F. is about as follows. He broke down 63 official R.C.A.F. casualty lists taken at random, involving 770 names, Ontario

gave 465, U.S.A. 96, British from Quebec 86 and French from Quebec only 31. The item does not state but presumably the rest were English.

In the lists analyzed, the U.S.A. casualties in the R.C.A.F. were three times as large as those of the French from Quebec. The total population of Canada is 10,376,876—1931. The population of Ontario is 3,431,683. The population of Quebec is 3,000,000, of which 90 percent are French in race, language, culture and traditions, despite the fact that Quebec has been separated from France since 1759.

By order of the Quebec Act, passed by the English Parliament in 1774, the French civil law was recognized for the province and provision was made for withholding representative English institutions like those of other British provinces.

# America Must Choose

## Editorial

### *When I Was a Child*

AMERICA has come a long way in six generations. We have grown from a thin strip of settlements on the Atlantic Coast to be the mightiest industrial nation on earth. Our expansion has been so rapid that we haven't had time to look around and see where we are going. The trail of our national history is marked by the monuments of many historic and spectacular achievements. But it is also littered with the tombstones of many unsolved social problems. The mistakes of one generation were invariably covered up by the expansion of the next. During our rapid development, we always followed one paramount negative rule as individuals and as a people.

That rule was the denial of any positive social direction. It was always every man for himself and the devil take the hindmost. If a man didn't want to work and save and succeed, that was his own lookout. If he couldn't succeed at home, he could always go out West and grow up with the country. If he didn't like our system, he was always welcome to go back to the 'old country.' After all was said and done the system had justified itself in its major premises by its major achievements, so we always said. Social direction might be all right for those nations who needed it, but not for us; we didn't need it.

America was on the go; we didn't know where; but that didn't matter. As long as our expansion continued, we could justify ourselves and get away with such a nihilistic social attitude. Now, however, American civilization has reached the limits of its expansion under the Price System. In obedience to the immutable laws of dynamic equilibrium, we stand now, as a nation, poised at the peak of our growth curve. 'America has come to the end of an epoch!'

### *The Finger Points*

From here on out, there are only three ways we can go. We can move upward to a higher form of civilization, organized on a non-price basis. Or, we can jump off into the social and physical suicide of fascism; or chaos. We cannot stand still and we cannot go back to the good old roaring days of our national adolescence. We cannot turn back the clock of time and repeat our natural growth curve all over again. The growth process is unidirectional and irreversible. It only occurs once to each organism on this earth whether it be a dusty weed along the side of the road or an aggregation of human beings making up a nation.

For 150 years America went up like a rocket. Now the question is posed—must we come down like a stick? For 150 years, as a people, we resisted and refused all positive social direction. Now we find our-



selves in the greatest need for that which we never wanted before. Indeed it has suddenly become an indispensable necessity. The pressure of physical events dictates that we must now accept positive social direction or have its alternatives of negative social compulsion, or chaos, forced upon us.

If we move upward to a higher form of civilization organized on a non-price basis, it must be by designed social direction. If we backslide into fascism, we will find that it consists of a barbaric network of social compulsions in race, religion and economics, all equally repugnant to the best historic ideals of America.

If we indulge in civil disorder and strife, we will disrupt the flow lines of industry and break down the complex inter-related machine civilization upon which we are all dependent. In the resulting chaos, 75 percent of the population will perish by fires, starvation and disease. This was the picture of our national dilemma up to and including Dec. 6, 1941.

### *Rendezvous With Destiny*

To this internal, social dilemma was added the greater national danger of Total War on December 7, 1941. No nation can solve its internal social problems unless it is free from outside aggression. This war was forced upon us and we must win it or cease to exist as a nation. That is the greatest job which faces America now. However, the categorical compulsions of the physical laws of nature continue to operate in time of war as well as peace. Indeed they

are intensified. The same physical factors which determined the past expansion and present decay of the American Price System, as a dynamic producing and distributing organism, are still in operation. In its essence America's war problem is the same as its peacetime dilemma. The active factors involved now are part and parcel of the same irreconcilable conflict between advancing science and a static social system. The same futile Price System methods which had long failed to solve our internal social problem are now in active control of our war operations.

We may now expect their effects to be translated and magnified into terms of acute national danger, in place of the comparatively less harmful muddling from one futility to another, characteristic of their past efforts. Our political leaders don't even know what all the pother is about, and our smart business men are chained to the grindstone of profit by six generations of conditioning and accumulated tradition. America must look to its people for vision.

### *Of the People By the People—*

At the very best, if Price System methods do succeed in winning the war for America, it will be a long-drawn-out affair, at a staggering cost in lives of this generation and heavy burdens of debt to those who come after. And what of the peace which will follow? Can we expect Price System methods to win the peace? They won the first world war and lost the peace! If we win this war with Price System methods and lose the

peace, it will be a pyrrhic victory, and we will have to do the job all over again in a few years, with all the odds against us.

A scientific program of positive, designed social direction is the only solution for our internal social problems. The very same type of program related to the trend of world events today is the only dynamic with which America can wage this war successfully in the shortest possible time, at the lowest cost, and win the peace which follows, and, further, guarantee the future of America. Such a program has been all worked out. It is ready to be installed and America has the skilled personnel to administer it. Technocracy asks how

many futilities must we experiment with? How many disasters must we suffer before we install the program now called for by the trend of events?

Written across the map of North America by its natural geographical and geological constitution and the industrial characteristics of its civilization is the solution to our National problem. The key to that problem and the only possible social dynamic with which America can face the future is Technocracy's program of TOTAL CONSCRIPTION OF MEN, MACHINES, MONEY and MATERIAL, with NATIONAL SERVICE FROM ALL AND PROFIT TO NONE!

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### **Who's That Knocking At Our Door?**

'Barring some unforeseen change in the age ratios of our population, the United States right now has a greater percentage of military effectives in its population than it ever had before, or will ever have again. This is our hour of biological might and we would better not fritter it away in indecisive war, or patched-up peace.' Excerpt from *Chicago Daily News*, 11/27/43 editorial.

'During the next 10 years it may be decided whether civilization will continue to develop *toward a greater utilization of science* to free and dignify mankind, or will become petrified in a system of human exploitation greater than the world has ever seen.' Margaret Mead, Ph.D. quoted

in *Chicago Herald-American*, 10/28/43.

Applications of science to the field of human relations will bring about a new world in which wars will have no place, Dr. Franklyn Bliss Snyder, president of Northwestern University, declared last night here at Latin-American Dental Meeting.

'The great task before the world now is to turn to constructive purpose the energy, ingenuity, and patriotism of the scientists of the world. *We need to wed science to human relations*, both national and international. If we can combine these two, we can create a new world.' From *Chicago Sun* of November 9, 1943.





Photo—Courtesy Texas Gulf Sulphur Co.

Loading sulphur at Newgulf, Texas. In industrial civilization sulphur and its compounds play a big role. They're necessary in vulcanizing rubber for tank treads, tires, life rafts; in smokeless powder and high explosives; in plastics, rayon, matches, dyes, fungicides and insecticides; in metallurgy; and making superphosphate fertilizer. U. S. produces 3,500,000 tons a year. First resources then energy.



Photo—Courtesy Province of Quebec Publicity Bureau

Energy in the making at Shipshaw, giant Canadian power and aluminum project. Digging a  $1\frac{1}{2}$  mile long canal, wide and deep enough to float ocean liners, to relocate the Saguenay River. This gives a greater drop and 50 percent more power is obtained from the same flow of water. See May-June Northwest Technocrat, June Technocrat or July-August Great Lakes Technocrat of 1943 for details of Shipshaw.



Photo—Courtesy Bethlehem Steel Co.

Here is another kind of energy, the gamma rays of radium. Concentrated in this 250 milligram pellet, weighing less than 1/100 of an ounce, is the power of penetration to make silhouette pictures of flaws in the interior of marine turbine casings. The defective part is then excavated, refilled by welding and annealed to relieve stresses and rechecked by radium pictures. After energy comes technology.



Photo—Courtesy General Motors Corporation

Technology begins with measurement and planning and involves coordination. The draftsmen shown are working on some specific part of a coordinated design for production. Not so with our national effort as a whole. There are millions of conflicting plans for details but no master plan to orchestrate them. That is the greatest weakness of America. In resources, energy and technology we are tops.





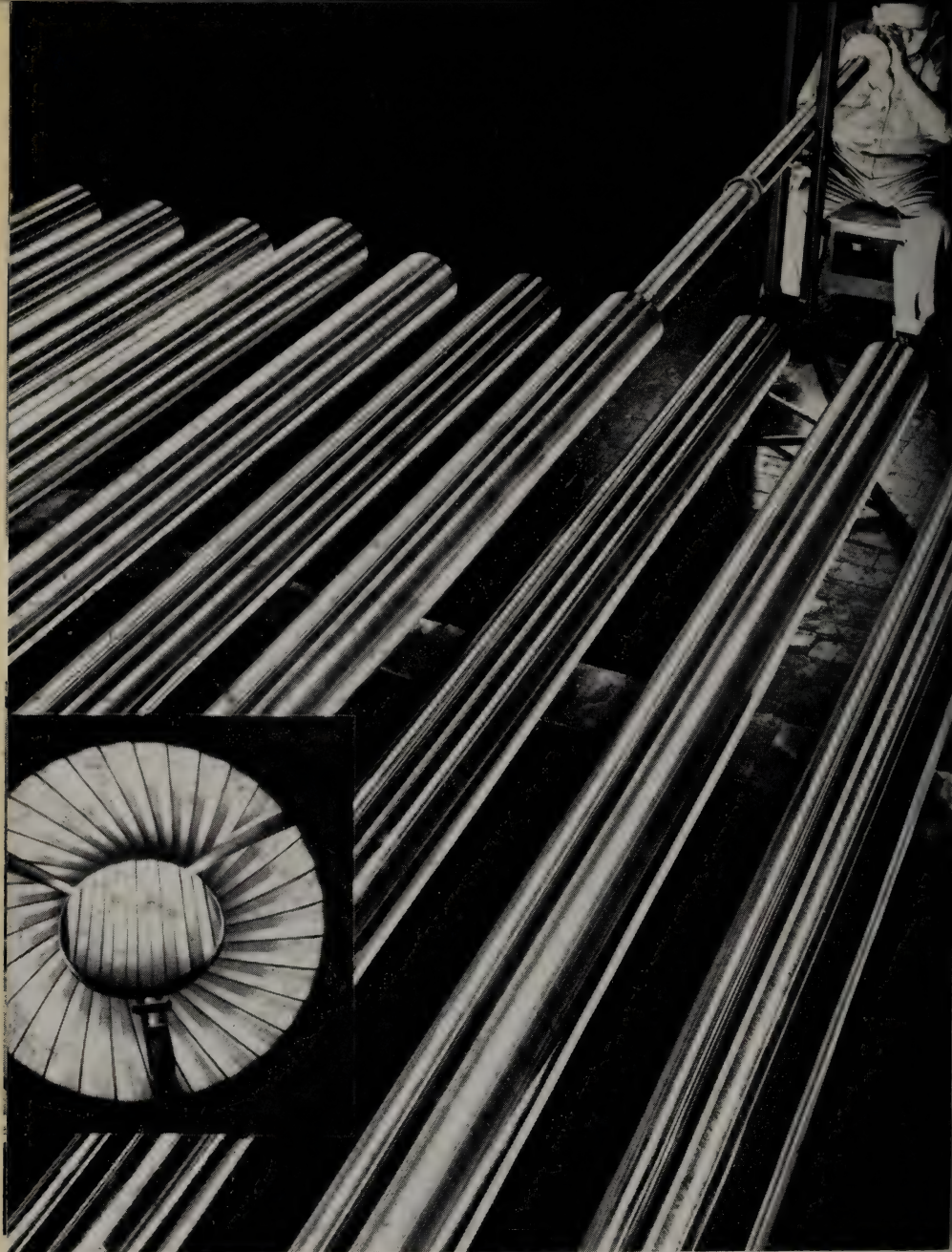
Official U. S. Navy Photo

The technological character of this war is illustrated by the special types of ships required to transport men, machines and materiel. The landing craft LST pull up to shore, two big doors open, a ramp is lowered and the half tracks, tanks and trucks roll out. LST are built at shipyards along inland rivers and Great Lakes ports. At Attu, Kiska, New Guinea, Rendova, Sicily their gaping jaws have opened wide.



U. S. Army Signal Corps Photo

Then we have the army's amphibious trucks called 'Ducks'. They haul 2½ tons of supplies, are propeller driven in the water and have six-wheel drives which carry them at high speed on land. They are designed for putting men and supplies at ordinarily inaccessible spots, supplementing LST. They hit the beach and keep right on going. America wages war with the tools of social change. The more the better. Catch on?



Photo—Courtesy Chevrolet Motor Co.

Inspecting the interior finish, bore and rifling of a 90-mm anti-aircraft barrel. Inset: closeup of the rifling as seen through the boroscope, a special optical instrument developed for this purpose. The diameter is also checked by a precision air gauge which measures the volume of air escaping from sealed in barrels. These guns have a range of 30,000 feet, can be fired by manual or remote control.





Photo—Courtesy General Motors Corporation

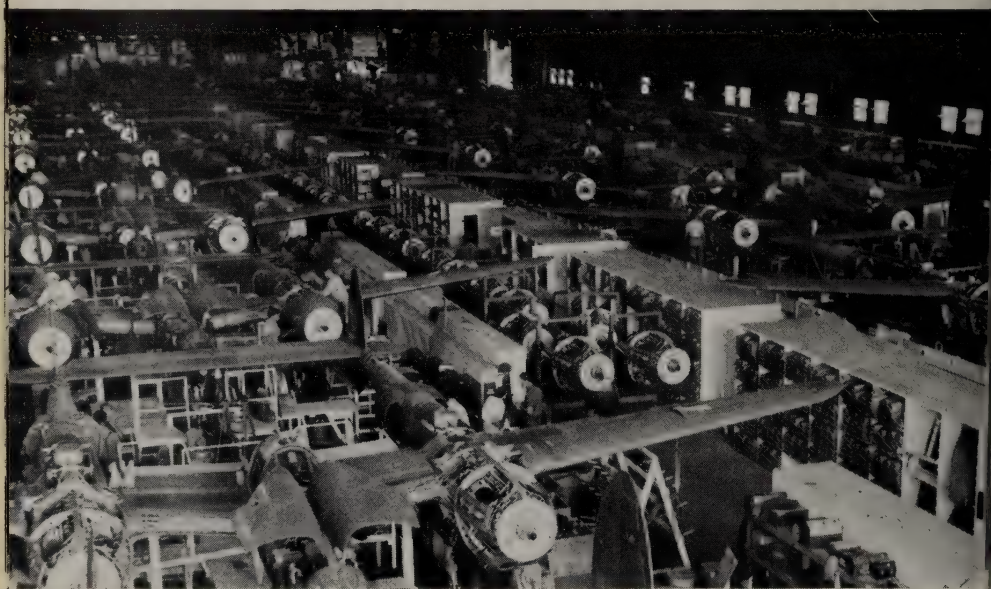
...ay that carbine down babe, after you've inspected it.' This short, light, deadly weapon (we mean the M-1) weighs less than 5 1/4 pounds and is replacing side arms and rifles in jungle and invasion fighting. It's the U. S. Army's new M-1 30 cal. all-purpose carbine. As weapons become more efficient they tend to become smaller and lighter with greater power. That's almost a rule for all mechanisms.





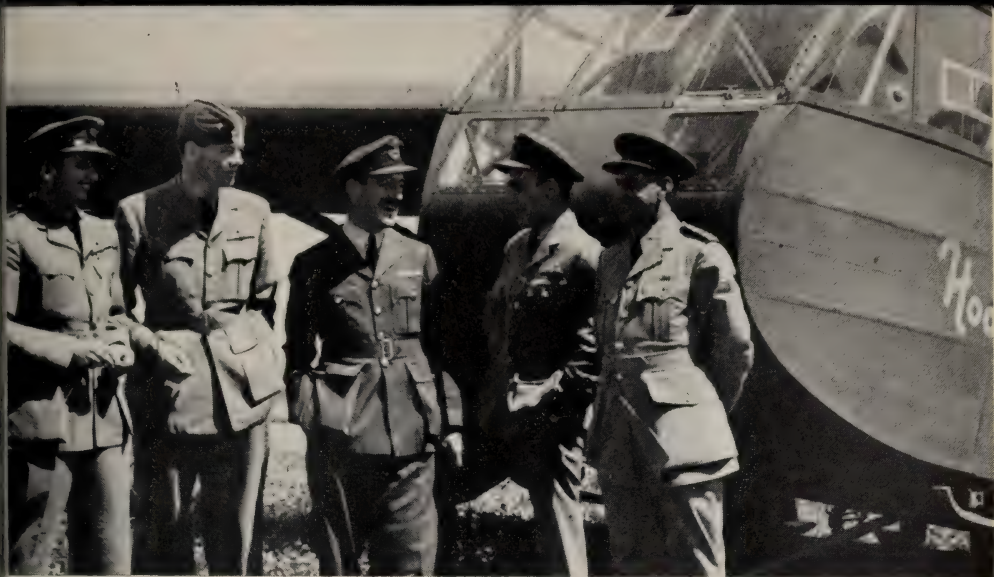
Photo—Courtesy Lockheed-Vega Corp

Here is the Lightning P-38, a plane that 'goes upstairs' 50 percent faster than a Zero. Its speed and maneuverability enable it to be used as an interceptor, dog fighter, dive bomber, tank destroyer, camera plane or medium bomber. It flies at 'over 400 m.p.h.' yet lands at only 80 m.p.h. In its aerodynamic lines, one sees a closer approach to the flying wing. The ultimate is all lift and no drag.



Photo—Courtesy Lockheed-Vega Corp

The P-38 is produced on a continuously moving assembly line. The installation of this line required eight days but it doubled the plant's output and resulted in a 40 percent reduction in man-hours per plane. Sub-assembly lines carry engines and parts to the main line. Workers ride the ships as the line moves along. Maximum production involves maximum technology and minimum man-hours of labor.



Photo—Courtesy Province of Quebec Publicity Bureau

Here is a different kind of flying. Towed by a twin-motored Dakota these R.C.A.F. officers recently made the first glider flight across the Atlantic, from Montreal to England. Glider trains are being talked about for post-war use as freight trains of the sky. It's simpler to build giant Flying Wings. They'd require less man-hours per ton miles of freight hauled. Who wants to work anyhow?



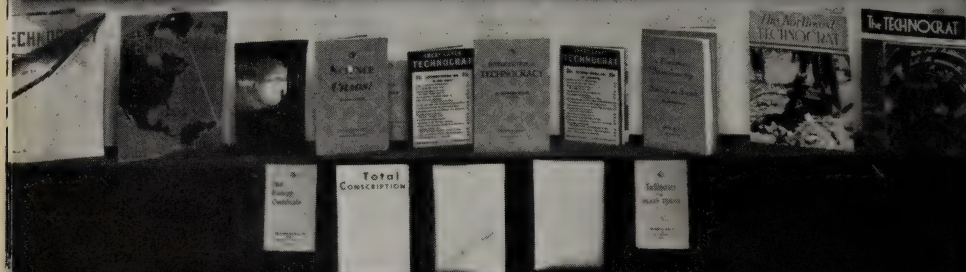
Photo—Courtesy Caterpillar Tractor Co.

Here's a Caterpillar Diesel D7 tractor with Hyster arch hauling logs at Montgomery Creek, Calif. Its average load is 3500 to 4000 feet; the cost of operation about 20 cents an hour for fuel. That's technology. The full application of technological methods will conserve natural resources. In 1942 we permitted an area of forest to burn down equal in size to the State of Louisiana. That's HELL.



# TECHNOCRACY'S FLYING WING

330 FT. WING SPREAD  
CEILING 35,000 FT.  
RANGE 10,000 MILES  
SPEED 300 M.P.H.  
BOMB LOAD 50 TONS  
DIESEL ENGINES



Technphoto by J. R. Rushing

## IDEAS ARE COMMON PROPERTY, HELP YOURSELF

Technocracy has a large and growing volume of literature. This includes four continentally circulated magazines, numerous pamphlets and a Study Course Book. The body of thought expressed therein cannot be obtained at any school or college. It's scientific, new, factual and unanswerable. The above picture shows a window display installed in one of a chain of ten cent stores at East Orange, N. J. by Technocrat J. R. Rushing. A supply of literature is available inside the store.

Technocracy is an all-American organization. It salutes America's technology and her gallant citizens in the armed forces who are applying it against fascism abroad. Total Conscriptation of Men, Machines, Materiel and Money With National Service From All and Profits to None will make their job easier by intensifying the technology of war; and also insure all Americans against the perilous post-war period ahead.



# Unconditional Surrender Begins At Home

by M. M. Fertig

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**Headline, in an American newspaper (date and name of place withheld purposely):**

**'THOUSANDS OF MEN, WOMEN NEEDED AT ARMY DEPOT'**

**The text of the news item stated that men and women would be schooled in the depot's modern training shops, where the most up-to-date machinery had been installed. These workers were going to be taught machine technology.**

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## *Technology at the Cross Roads*

**T**ODAY'S machine technology—doing things with machines—and that primitive way of doing things with hand tools, which has consolidated our spiritual, political and economic rackets into a major oligarchy, these are the two physical forces engaged in Total War. Before long we will have not thousands, but millions, of Americans who will know the fundamental principles of the machines they are operating; more than that, they will become skilled in utilizing machine elements. Our greatest need is for all of us to adjust ourselves and our ideas to this fact.

This fact of our technological knowledge and skill should encourage us, for it automatically points out

to us who our enemy is in this Total War. Our enemy is any person or way of life which dictates that we must do by hand that which we can do by machines and extraneous power, and who or whatever system that 'makes money' off our labor, through the medium of a price and restricted distribution.

War has accurately been called 'the passion of Death.' The victor in this war will emerge the master over science. If that victor has been conditioned to ignorance or suppression of mechanical techniques, or is engaged in politics, or manipulates exchange in the market place, he and his group of followers will most surely murder science. They will do away with all scientific research and with the courageous men and women who might work at it.

On the other hand, if that victor is a group trained to operate our physical equipment in accordance with the principles employed in its technological design, then this group will automatically free science from the ages of former interference control. That interference control, which in recent years has attempted to become more and more pressing, we define as fascism.

Science, once it is free from fascist control, will be able to correct our centuries old social deformation, known as poverty in the midst of

plenty, our human toil in so very weak competition with our extraneous energy, our diseases, where sanitation and health could make us happy. Those men and women at the machine shop bench, production operators, patternmakers, technicians in all fields of military and civilian activities—these are the ones who have the power to choose *technology* to be the victor. It happens to be the first time in history that they have had this opportunity because never before were they trained for technology in such great numbers. They are not real Americans if they permit a stultifying community of fascist interests to control them.

### *Who Are the Fascists?*

How can the strategic term 'unconditional surrender' be applied to but one group of people—the axis alliance—and only on the bloody battlefield, when these same two physical forces—fascism or rule by decree, and technology or rule by the physical design—involve the internal structures of all nations of the world and all the communities of the United States with hardly a single exception?

The battlefield with its blood and horror is but an emotional symptom, a social tantrum, as the one progression, fascism, aging itself into senility, attempts to intrench its inertia against which the other progression, technology, must advance. The actual conflict exists between the pressing emergence of a new social doctrine and the ages old, obsolete folkways and traditions, inherited from our

dead agrarian past in our daily practices in our various home towns all over the nation.

It is each citizen's personal, patriotic obligation to find out who the fascists are and *why* they are that way. He may find out, if he is honest with himself, that he is unknowingly one of them. And it is our national, patriotic obligation to either educate our native born fascists, or if that seems impossible, to let the march of events liquidate them in the same manner that the march of events is liquidating their private enterprises. You know the people who have been forced to climb on the government subsidy wagon. Are you one of them?

No one, and no government, under the system of private initiative and private enterprise, can rejuvenate for very long the era of industrial expansion to which the fascists have tied themselves hand and foot. The fascists have to discover that fact for themselves, either the easy way by education, or the hard way by eventually going through social bankruptcy.

### *Design Is the Essence of Function*

In 1941, *Harpers* magazine published an article by George W. Gray. This article told of an experiment at the Rockefeller Institute of Medical Research. This experiment was not conducted to regain a woman's youth, but with an eighteen year old dog serving as the laboratory guinea pig. He was a feeble creature, hardly able to stand up to eat. Dr. Alexis Carrel decided to change the dog's blood in the attempt to rejuvenate him. He



extracted the blood, washed the red cells, compensated with a chemical fluid for the quantity of blood washed away and then replaced the red cell blood for that which had been senile blood. The old dog became a new dog. Instead of curling up in a corner he ran and barked and gayly associated with lady friends. He acted much as our Price System is acting today under the forced stimulation of monetary injections into the arteries of commerce.

But by the time the dog's rejuvenated blood had absorbed the accumulation of age-produced poisons, while he had been enjoying himself, poor doggie was again old. Dr. P. Le-Compte, who first told the facts to the public said: 'Repeated removals of the old blood and its replacement with new serum had only a temporary effect of rejuvenescence.'

This same article told about the famous Steinach and Voronoff operations on old men. The operations 'were followed by indubitable cases of improvement in appearance and general condition and by the revival of the sexual function, but the grafts withered and were absorbed, the other changes relapsed, and rejuvenescence was temporary.'

Within the light of science we need to understand two things: (1) Why is rejuvenescence but temporary in older mechanisms? (2) Why cannot our Price System be permanently rejuvenated as the many post-war planners would have it?

The reason that rejuvenescence is but temporary is in the fact that cer-

tain *internal* balances are always the main design of the totality of anything. These balances may shift but they must always be in the designed relationship to the purpose they are serving. The power to do a given thing must be *easily* transmitted from its point of origin to its point of use; the driving function must be in unison with the driven function and vice versa. When internal balances have gone haywire, whether through wear or some act of positive dislocation, that person can no longer channelize his energy into optimum power; or if the example is an inanimate mechanism, it can no longer function properly. Rejuvenescence cannot create permanent internal balances because it cannot restore that which has been used up. The laws of thermodynamics are unchangeable; they function whether or no. No man has yet outlived nature's physical choice for his particular span of life, nor has any other mechanism or system.

Here is a good definition of a machine; we can aptly apply it to the Price System as a machine *gone bad*. 'A machine is a combination of elements which transmits motion from one to the other until the desired force and motion are delivered at the point of productive work. The various elements must be held in their designated places or paths and allowed to move as required by the design.'

Why do we say that the Price System has permanently gone bad? The Price System *was* a workable mechanism before technology expanded, but

now technology, one of its prime internal elements, can no longer be combined in a pattern which will transmit the desired force and motion at the point where specified work, our war requirements, will be accomplished.

In other words, what should be the internal balances of the Price System have already become too greatly unbalanced for the optimum operation required by this twentieth century conflict, and the peace that must *grow* out of that conflict. Peace will not be a rootless and separate event. That is why we can accurately say that all post-war planners have started on the wrong track.

Up until December 7, 1941 the native consolidation of spiritual, political and economic rackets into a major oligarchy, the fascists, was able to balance our technology, however poorly, within the Price System. Since then our highly developed technology no longer fits within the Price System machine. It can no longer be driven in alignment with the fascist driving proclamations; instead our technology has become the driving power.

#### *A Word to the Wise—*

Fascism is on the skids in Europe. It was American technology that made it possible for the Allies to chase the Axis out of Africa. It is American technology that is helping Russia. It is American technology which is preparing itself for the Pacific struggle. Gather these facts together, then try to answer this question: What does unconditional surrender mean? Who and what terri-

tory is going to surrender unconditionally? Get into the habit of wording your concept of 'unconditional surrender' so that you can easily substitute its intelligible definition.

How do the fascists in America define 'unconditional surrender'? How do the fascists in your neighborhood, at your place of work, define it? They just don't; they totally ignore the facts which give it meaning.

They ignore the fact that Hitler, Mussolini and Hirohito established a geometrical relationship, a triangle; that the fascists in your home town too have established a triangle. In the international triangle whoever is behind Hitler is angle A; whoever was behind Mussolini was angle B; and whoever is behind Hirohito is angle C. The relationship of these three fascistic 'fronts' to the political, economic and spiritual rackets in the international triangle are no different from angle A, angle B, and angle C in your home town. Just who is angle A, angle B, and angle C in your home town? What are their names?

Detach all your sympathies and affections, where necessary even your family loyalties, for we must consider this a geometrical problem which must be understood before we can prosecute this war successfully. Have you forgotten the elementary fact that any two or more triangles having the same shape, although different in size, are said to be similar triangles? Never forget, similar triangles always have two corresponding 'parts'-altitudes, medians bisectors, in the same ratio as a pair of corresponding sides.



And it is a most important geometrical fact that 'corresponding angles of similar triangles are respectively equal.' In other words, a Penny fascist in a Penny town is just as vicious, as dangerous in that Penny town as a dollar fascist is in a dollar town, as the fascists within the Allied set-up are to the Allied nations, or as Hitler, Mussolini and Hirohito were to the area of the Axis alliance. The sizes of the respective areas have nothing to do with certain persons' angular positions or functions.

Every day our technicians are discovering easier ways to do things. The simple fact of these discoveries is part of the continuous process of applying the superior powers of the lever and the inclined plane with the accompaniment of gears, pulleys, cams, threads, machine bearing and other mechanical elements. The fascists accept these discoveries, without digesting their real significance, as just additional means whereby they may, both now and in the future, 'make money.' The fascists are too ignorant of science, too blind to see what is going on to recognize this growing technology and its growing capacity; so they sentimentally consider themselves to be honest-to-goodness Americans when they fight to preserve their Price System.

### *Acres of Diamonds*

War is the passion of Death. It will eventually yield a victor, and the vanquished will have performed 'unconditional surrender.' The *why* for it is basic in nature, So that America will not be the continent

to suffer unconditional surrender, America must continue to be a body in uniform motion in a technologically straight line. America's uniform motion in a technologically straight line is toward more and more technology. Very simply stated this is: There shall be more and more people coming within the technological pattern.

Private enterprise cannot possibly install more and more technology without completely wrecking Private Enterprise. Actually, Private Enterprise completely wrecked itself when it, all over the world, instigated World War II. With each new technological installation, the internal balance within the Price System, that is, the relationships between the driving force and the driven force, changed. It was the increased frequency of oscillations which wore the Price System out.

Then who must install the necessarily complete technological pattern? The people themselves, the augmenting number of operators who have become skilled in working with machine elements; they must subscribe to the Total Conscription of Men, Machines, Materiel, and Money, exacting National Service From All, and yielding Profits To None. When in the course of events it becomes definitely necessary for one people, Americans, to change its mode of physical operation, it is treason for any minority within that people to obstruct such change.

Unconditional Surrender begins at home. Unconditional surrender

means that the Price System mechanism, as a way of producing physical operations, shall be abandoned beyond the possibility of resurrection; that all persons as individuals or groups, who have held as their vested territory any physical equipment, patents or ideas, immediately shall yield them to the common welfare. Unconditional surrender means that

from thence forward the actuality of living shall be based solely upon the technological possibilities, with each man's relationship to God his own affair. When we set our continent in order, then and only then, may we expect unconditional surrender to occur as the basic morale in the other countries of the world.

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### ***Divided We Fall***

'One cannot move about Washington without bumping into the fact that we are running two wars—a foreign war and a domestic war. The domestic war front is in the various war boards. Every great commodity industry in this country is organized nationally, and many of them, perhaps most of them, are parts of the great national organizations, cartels, agreements, which function on both sides of the battlefield. Here in Washington every industry is interested in saving its own self. It wants to come out of the war with a whole hide. One is surprised to find men representing great commodity trusts or agreements or syndicates planted in the various war boards. It is silly to say New Dealers run this show. It's largely run by absentee owners of amalgamated wealth, for the most part these managerial magnates are decent, patriotic Americans. They have great talents. If you reach them in nine relations out of ten, they are kindly, courteous, Christian gentlemen. But in the relation where it touches their own organization, they are stark mad, ruthless, unchecked by

God or man, paranoiacs, in fact as evil in their design as Hitler. They are determined to come out of this war victors for their own stockholders, which is not surprising. These international combinations of industrial capital are fierce troglodyte animals with tremendous power and no social brains.' (William Allen White, editor of the *Emporia, Kansas Gazette*, 5/15/43).

At a recent session of the House of Representatives, the food subsidy bill was under discussion and Rep. Clarence Cannon (Dem. Mo.) had the floor. These are his words: 'I have always followed Mr. Green on labor bills. But this is not a labor bill. This is a farm bill. On this bill I will follow the farm leaders.'

There you have it, cold turkey, a frank submission to the dictates of minority pressure groups. There's no poppycock about leadership or an inquiry into the facts. It's a straight routine of first counting the noses involved in any minority group proposal, then representing it accordingly. Is that why they call it the house of representatives?



# Three Recipes for Going Crazy

by Publications Division 8741-1

## *Safe As A Bug In A Rug*

A SMALL company manufacturing war materiel in the Detroit Ordnance District reports as follows. All its employes are covered by a blanket industrial accident insurance policy. Before getting the policy, the company had to set up certain rather strict safety mechanisms and policies. In addition to this they are required to meet the State safety standards, those of the city of Detroit, the City Fire Department rules, the City Health Department regulations and those of the State Health Department also. Well, one otherwise fine day along came a delegation of U. S. Army Officers on a National Safety Standards' drive, sponsored by the Army. The management was given to understand that its cooperation was expected—or else. This last safety drive being the seventh and each one being sponsored by a different branch of authority, the management is now wondering who'll be the eighth and if there are any new safety wrinkles out lately.

## *'They Can't Put You In Jail for That'*

Another small company, over a period of time, received a bale of forms and reports to fill out from the various Government agencies. There were forms on everything imaginable connected with their part of the war business from raw material priorities to labor-management relations. The

ability of the company to fill out these forms declined in inverse ration, as the flood of paper rose. Finally they got a hot letter from the WPB accusing them of not cooperating with the war effort. Here is the company's answer:

War Production Board

Washington, D. C.

Attention: Mr. T. K. Quinn,

Director

General War Production Drive  
Gentlemen:

Unfortunately we are not a large corporation operating under cost-plus and therefore supplied by a benign government with endless droves of idle help. Our office and supervision personnel are over-taxed with work that has to be done to keep the wheels rolling and we, therefore, have adopted an attitude concerning the endless requests for reports and cooperation from all types of political interference control agencies that is simple and direct.

If they can throw us in jail for not doing it, we will gladly cooperate. If not, No. Will you kindly enlighten us on this point?

Yours very truly,

H. V. Wilkie

## *Even a Mule Has Hindsight*

Another small company made a profit of \$540,000 in 1942 on war

contracts. Along came the Internal Revenue Department and took away considerably more than half of it in the form of taxes. This was all right, as it was expected, and still left the company with a neat little nest egg. However, in marched a renegotiator one day and demanded to see the company's contracts. Upon due examination, he altered clauses here and there and sliced down the gross profit to a net loss of \$130,000. The company protested that it had already paid out most of its profits in taxes and didn't have the money any more. The renegotiator replied that was none of his business but concerned the Internal Revenue Department. The company president was advised to try to get a refund on his taxes but would be expected to repay the Government his excess profits on the renegotiated contracts nevertheless.

If they get a refund on their taxes it may be possible to pay the Government back. If not, they're in the hole deeper than ever. In the meantime the company has accumulated a stockpile of Army-Navy Inspector's rejects. The product is of a type that can be sold as post-war merchandise. The upshot of the whole affair is that the only source of profit left to the company now is its stockpile of rejects. The stuff wasn't good enough for war use but can get by in the civilian market. After reciting his tale of woe to a Technocrat, the president of the company remarked: 'The more I think of it, the more I think the Government has done this whole war production effort wrong. *It*

*should have frozen the whole war effort at the beginning.'*

This was a beautiful opportunity to say, 'I told you so.' But Technocracy is not interested in preaching. Neither does it have any brief for either small, medium or large business; and no condemnation for Government renegotiation or tax collection agencies. The point is that nobody knows what the score is because there is a multitude of small conflicting plans for regulating production and distribution, but no over-all design for national operations.

If you want to go crazy, here are three good recipes, but there are many others. Every American who thinks he can beat the American Price System has a good recipe for going crazy. It matters not whether it's the lone wolf worker trying to get rich by the sweat of his single-handed labor; the cockroach 'capitalist' shopkeeper performing his interference functions in the distributive mechanism; the small business man ground beneath the upper and nether millstones of a chaotic economic system; or even the astute representative of large monopoly enterprise scheming for mid-war profits and post-war cartelization.

There is only one highway to individual sanity and security in America today. That is by way of Technocracy's design of Total Conscription of Men, Machines, Materiel and Money with National Service from All and Profits to None. Collective security is the answer to all individual problems.



# *Inquisition At Detroit*

by R. B. Langan

## *Detroit Is As Detroit Does*

THE city between two lakes is now engaged in the production of bombing planes, airplane engines, parts of all types and war equipment in general. What though the pay-rolls are padded, the inventories are inflated, the workers are falling over each other and the factory crap games are heavily patronized during working hours; nevertheless, the war materiel rolls out of Detroit plants in staggering quantities. The fact that production increases its tempo while accompanied by the best planned methods of waste is a tribute to American technology. Of course, the waste adds to the profit, which makes it good business. Detroit is not unique in this type of social behavior. It is a national characteristic of the American Price System.

Besides the production of physical goods, the fame of Detroit has been polished bright by its efforts in the intangible field of art and early Americana. That nostalgia for the years that are gone forever, which seems to be a national trait, finds a loud expression in Detroit. There one can see Greenfield Village where the past of America has been frozen for the edification of the present and future. It is worth a visit if only to learn what America has escaped from, and in small part how that escape was accomplished.

There is also the Detroit Institute

of Arts, famed for its mural paintings. This museum, sponsored by the liberal arts schooled parvenues of this area, was understandably built in Renaissance style. This architecture is completely out of harmony with the characteristics of a modern industrial city. It is symptomatic of the social thinking of most Americans, i.e., completely out of harmony with the realities of the Power Age.

After vegetating for years as one of America's many second-rate art museums, those with the directive power in Detroit decided that it needed distinction. So they engaged the talents of Diego Rivera, called the world's greatest living mural painter.

Rivera came to Detroit in 1931 and spent a year painting frescoes on the walls of the Garden Court in the Institute of Arts. There are 27 panels in all on the four walls. The brochure of the Institute says that Rivera was 'determined to picture our gigantic industrial culture, and then to follow it back into its basic elements.' If this is a correct statement of the end sought after, then Rivera's murals must be classified as complete failures.

It is true Rivera sees form and movement in industry rather than mere atmosphere. This is something. 'He honors the engineer, the mechanic, the scientists. He used life as his model.' The frescoes are called 'magnificent in design and admirable

in detail. But in the last analysis their power lies in another thing—their largeness of conception.' This is extravagant praise indeed. Let's see what it all amounts to.

### *If You Want To Do, You Must Know*

Before one can form an accurate appraisal of the Garden Court murals, one must know the culture depicted and the physical America to which it is native. It is not sufficient to look at them from the viewpoint of artistic technique alone. Rivera 'used life as his model' but nowhere does he tell the story of energy on which all life depends. The mere picturization of a lump of coal, a few other minerals and an energy-converting device here and there, crowded in between a multitude of workers, does not tell the story.

The Institute murals are too much concerned with people and too little concerned with the giant forces producing the trend of events on this Continent. This kind of art is not American. It is hyphenated.

A visitor comes away from the Institute with a feeling that there is much more to the story of our 'industrial culture and its basic elements' than Rivera pictured.

In the culture of the Power Age, physical wealth is not produced by human toil and hand tools. It is produced by energy and technology. Therefore, while humans are always necessary in an attendant, accessory or supervisory capacity to the industrial machine, their relative importance as producers declines, while the necessity for integrated operation of the entire mechanism increases.

This necessity dictates a design. Thus, while the Rivera murals completely fail to 'picture our gigantic industrial culture and then to follow it back into its basic elements' they also completely ignore the future of that industrial structure. The method of American technology pictured in these murals is accurate enough. But it hangs in the air by itself, fully developed, without birth or puberty, nor any hint of a probable future.

The art of yesterday is mainly the art of people. The true art of America must be an objective art of things and events in the real physical world in which we live, in addition to people. To portray the art of America, it is not enough to 'honor scientists, engineers and mechanics.' One must tell the whole story and let the facts convey a proper contempt for all the phony values of this Price System. More, such an art must project itself into the future, on the basis of that which is most probable, and in harmony with the parallelism of events.

### *There Are Murals and Murals*

Detroit is big, its streets are clean and spacious and seem to reach out toward an ever-receding horizon. Its industrial conceptions are large and their execution lags not far behind. Surely, somewhere in this archtypical industrial center one should be able to find some real American art that truly represents the science and engineering that is germane to the physical North America in which we live!

Yes, there is such art in Detroit, but it cannot be found at the Institute of Arts. Such art as portrays what America is now, how it came



to its present estate and where it is headed, cannot flourish in any Price System environment. Pretty roses may grow out of dung hills but integrity cannot exist 'where commerce long prevails.' Authentic American art that will meet the specifications outlined can only rise out of the most authentic, indigenous, American non-Price System environment. That, too, exists in Detroit.

The finest display of modern American Art-science in the city between two lakes is in the hall of the *Detroit Section of Technocracy Inc. at 9108 Woodward Ave.* This organization is neither an art school nor a museum. It is a dynamic research-educational body founded, staffed and operated by Americans drawn from all walks of life. Technocracy Inc. is dedicated to the installation of a Continental design of operations for the production and distribution of abundance and security for all citizens. As such, the function of the Detroit Section is to inform all citizens in its area of the irreversible trends that are shaping America's destiny and thus affecting the individual fate of every American.

The Section Headquarters' interior was designed and constructed to illustrate with graphic realism the Story of America, its past, present and future. There are some 30 odd picturizations, all told with a half-dozen mural paintings. These paintings illustrate North America as the number one technological potential of the world and its possibilities in a real American way of life when it is operated by scientific methods.

There is a sequential order of progression in the Technocracy murals and pictures. In other words, it is a story of America's greatness and littleness. One must start at the beginning and stick to the finish.

### *The Greatest Story Ever Told*

There is, first, the long static ages of human toil, hand tools and scarcity the world over. Then the slow growth of knowledge about physical laws. In time comes the first stages of the industrial revolution. Eventually, the Power Age culture of America arrives. Running through the veins of this complex development are the two factors, technology and energy.

The one thing that chiefly distinguishes man from all other animals is his ability to convert and use energy derived from sources outside his own body. Behind all modern technology is extraneous energy derived from coal, oil, gas, wind and falling water. The story of its rate of increase of conversion and use is basic.

Accompanying it are the operating characteristics of the system of trade and commerce, called the Price System; the superimposed, political and social structure, its enforced social regimentation of the human components involved, and the wide-spread mental obeisance to abstract ideologies which have no real existence in the system itself.

Then we have the net end results, such as growth in population, mountainous rise of debt, increase in production but enforced scarcity in distribution, rise and eventual decline

in total employment, constant decline in manhours per unit of production, widespread want in the midst of potential abundance; a whole host of secondary social problems generated by the system, such as crime, ignorance, disease, etc., and the inevitable shrinking of all the artificially concocted 'values' of the system back into the nothing from which they came with the irresistible forward march of technology. The human beings involved become less and less important and necessary except as a means of exploitation in any Price System.

After spending an hour in Technocracy Hall at 9108 Woodward Ave., one comes away with a new sense of citizenship. America is great; it is only some of her people who are little. This is a land of sleep-

ing giants, with a potential future that almost beggars description. One comes out knowing that he, or she, as an individual American can participate in that future. But it must be won. The visitor is made to realize that America has a big job waiting for her citizens and that the great future of this motherland will only be realized to the extent that her citizens dedicate themselves to the unfinished task that lies ahead.

Of such is the true art of America, illustrating the past, living in the present and pointing the way to the future. Let the dilettantes play around with decadence. The alert American who is aware of the social obligations of citizenship in the Power Age will seek out that which is closest to the heartbeat of America.

### **The American Language**

On June 19, 1923 the Legislature of Illinois passed an Act reading as follows (*italics ours*):

WHEREAS, since the creation of our American Republic *there have been certain Tory elements in our country* who have never become reconciled to our Republican institutions and have ever clung to the traditions of king and empire; and

WHEREAS, America has been a haven of liberty and place of opportunity for the common people of all nations; and

WHEREAS, these strangers within our gates who seek economic betterment, political freedom, larger opportunities for

their children, and citizenship for themselves as Americans; and . . .

WHEREAS, the name of the language of a country has a powerful psychological influence upon the minds of the people in *stimulating and preserving national solidarity*; and

WHEREAS, the languages of other countries bear the name of the countries where they are spoken; therefore:

Section 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly: The official language of the State of Illinois shall be known hereafter as the 'American' language.*



# Bankers Distribute Revolutionary Literature

by The Peripatetic Technocrat

## *Even Nice People Do It*

Probably 9 out of 10 people walking the streets of America's cities are carrying revolutionary literature around in their pockets and don't know it. The Federal Reserve System and every bank in the U. S. have been distributing this radical material for the last seven years or so. It is turned out in the millions of copies by the U. S. Mint.

All one has to do to get a supply of this inflammable literature is to hire out on the payroll of some corporation, whether padded or not. They will turn over a supply of it to you on your first payday. Of course, there are quicker and easier ways to get the stuff, if one is of a mind to, such as clipping coupons, cashing rubber checks, or some other short cut to Easy Street on the illicit fringe of the Price System. But most citizens are rather dull and law abiding to boot, so they prefer the harder way of working for theirs.

The revolutionary literature referred to is none other than our good old one dollar bill. It is nationally respected, one might almost say worshipped, and keenly sought after by every citizen. Few suspect that its apparently innocent appearing surfaces contain what amounts to an epitomized history of civilization up to date and an accurate projection into the future.

On the front side is an imprint of the head of George Washington, the Father of His Country. How true that old saying is: 'First in peace, first in war, first in the hearts of his countrymen.' The saying refers to George Washington, not the one dollar bill. One could easily assume the opposite from an observation of the behavior of people with regard to money.

The first message carried by the dollar bill is on the front side. It conveys the information that there is on deposit in the Treasury of the U. S. one silver dollar payable to the bearer on demand. It states also that the certificate is legal tender for all debts, public and private. Nothing startling about that, although there is more to it than meets the eye. These statements contain enough material for an enlightening article on the nature of money and debt and the ancient professions of money changers and debt merchants. We'll not go into that now though. The point we're trying to get to is on the reverse side of the one dollar bill.

## *The Unfinished Job Ahead*

Take one out of your pocket, turn it around and study it while you ponder the significance of the motto printed boldly upon the reverse side of the Great Seal of the United States. '*Annuit Coeptis Novus Ordo Seclorum*' is imprinted above and below the unfinished pyramid. This has a pro-

found meaning for America today. It is written in the dead language of Latin which neither time nor human use can change through the ages. It means exactly the same thing today that it did in 1776 when it was adopted, note the Roman numerals at the base of the pyramid.

This Nation was founded in 1776, and the building of the unfinished pyramid began. For the first 160 years of our national existence the reverse side of the Great Seal was not imprinted on American money. Eight years ago the Government decided to use both sides of the Seal on the dollar bill. It is fittingly appropriate at this time.

The Founding Fathers must have known that the Nation they were building could not be completed by them. So they left the pyramid unfinished with the apex pendant above. Within the pyramid's peak is the all-seeing eye. This means that a greater wisdom than theirs would have to come along in the fullness of time to finish the work which they had so ably started. That time has now arrived.

### ***They Know What They Want***

'... By and large, Americans are the most mechanical people in the world, and so the most alert to physical cause and effect.' Excerpt from editorial under that title, *Chicago Daily News*, 11/17/43.

"Give me matter and motion and I will construct the universe."—Rene Descartes, 1596-1650.

As the juggernaut of technological war rolls on into its fifth year the motto imprinted on the Great Seal, and so boldly adopted by our young Nation, begins to acquire its first real significance for the American people. History records the rise and fall of many Nations, Cultures and Civilizations. As man progresses onward through time, space and events he leaves the old order behind him and takes up with the new, or else becomes extinct. Where is the Cro-Magnon race now; or the numerous civilizations of the past that have waxed and waned?

So it always was and so it always will be. Men and Nations must either go up or down, backward or forward. This is the rule of change. America once faced the future boldly; perhaps it will do so again. The Founding Fathers of this country gave us a watchword to go by. Nearly every person carries it around in his pocket book. The motto on the reverse side of The Great Seal of these United States is: *'Time Makes Way For A New Order Of The Ages.'*

### ***A Definition***

'My own summary of the "private enterprise" philosophy is this: One man's meat is another man's flesh.'

Letter to the Editor, *Chicago Sun*, 11/29/43, written by Ervin A. Henning.

The institution of private enterprise for private profit is conducted at public expense.



# Industrial Birth Control

by Edwin A. Lahey

Reprinted by Permission of the Chicago Daily News

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## **Calls Industrial 'Birth Control' Man's Most Ironic Work in Last 50 Years.**

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Industrial birth control is probably man's most ironic achievement. For the last half century it has meant that in a great period of mechanical achievement development, we have been able to restrict production through cartels and monopolistic price controls. Henry Wallace summed up the tragedy of restricted production in his Detroit speech last July, when he reminded critics of the 'baby pig killings' that countless tons of unborn baby pig iron had been aborted by the economics of monopoly.

The story has been told well enough. The files of the anti-trust division under Thurman Arnold, the voluminous record of the monopoly committee hearings in Congress, the history of the Fair Trade Commission and other sources tell what has happened to production since the coupon clippers became dominant in the control of industry.

The aspects of restricted production are all around us in our daily life.

### *Plaster Monopoly-Produced*

The plaster on the walls of your home is produced under monopolistic, price-fixing conditions. The price of

the gypsum which goes into plaster increased 100 per cent between 1929 and 1939, despite the great depression.

The shoes you put on in the morning are made on machines that the shoe manufacturer must rent, and cannot buy, from the corporation which controls shoe machinery production through patent ownership. The corporation, by virtue of its leasing arrangements, has an obvious influence on price and production policies.

The streetcar in which you rattle downtown in Chicago is flat-wheeled because a tight little coterie of mortgage bondholders are better off as long as the city lacks a modern, costly transportation system.

### *Farm Tools Price Controlled*

The farmer has a barnful of machinery which had a price flexibility of 15 percent during the depression in which the prices of the farm products had a flexibility of 65 percent.

President Roosevelt a few weeks ago expressed opposition to any post-war tariff on rubber, which might protect our wartime synthetic rubber factories. But he ignored the important fact that even the price of crude rubber was always kept at artificially high levels through centralized control of the trees by the Dutch and British. The international aspects of

monopolism are fresh in everyone's mind, with the Truman committee of the Senate of the cartels of German, British and American corporations, in which world areas were split up and compacts made to restrict production.

### *85 Cents or \$45 Per Pound*

And only a few days ago Assistant Attorney General Wendell Berge told a Senate committee how the chemical industry sold a certain plastic for industrial use at 85 cents a pound, but charged \$45 a pound for dental use. When dentists got smart and began purchasing the plastic from industrial users, one of the great chemical corporations proposed that the industrial product be spiked with the addition of arsenic, which would make it unacceptable for dental use.

Some years ago the maker of a well known safety razor blade was worried about imitations which were

just as good and much cheaper than the original blade. This manufacturer set up a plant of his own to make an imitation of the imitation. The fake imitation was so bad that the customers came back to the original blade.

There never was a better time to cogitate about these phenomena, because we have given up the vicious practice of industrial birth control during the war. Our industrial capacity is staggering our own imaginations. If the implications are made plain, it should not be too difficult to stir a demand for full use of our productive facilities for peace-time products.

*Editor's Note:* As to whether or not 'we have given up the vicious practice of industrial birth control during the war' as Mr. Lahey seems to think, we refer the reader to the leading article in this issue. Let the facts speak for themselves.

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### ***The Last Shall Be First***

'I cannot consider that production has met its goal until we have met all overseas demands and have fully equipped our troops in training. I go beyond this and say that we are not prepared for total war until we have accumulated a substantially strategic reserve of all important weapons of war.'—Lt. Gen. Brehon B. Somervell.

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'In the first three months of this year the United States had more fires than in all of 1942, which in turn was the worst year in 25 years. Consider the fire that destroyed a grain elevator in Minnesota. The money

loss was \$1,350,000 but that was only a minor part of the disaster. That one elevator contained sufficient bread rations to feed an army of 700,000 men for an entire year.' *Colliers* (9/25/43).

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Mechanical sugar-beet harvesting machines may replace men almost entirely after the war. This mechanical harvester is the invention of a Pueblo, Colo., beet farmer.

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America has 2,264 industrial research laboratories today; in 1900 it has less than a dozen.



# Technology Marches On

by Research Division 8741-1

## *Smaller and Better*

Production of electronic control tubes is running 11 times greater than in 1941 at the Westinghouse Lamp Division Plant, Bloomfield, N. J.

The Selas heating plant used in American bombers to keep the cabin warm at the way-below zero temperatures in the sub-stratosphere, weighs but 8 pounds. It takes up only 1/5th of one cubic foot, yet delivers 300 cubic feet of hot air per minute. Its thermal efficiency is 87 percent.

The new Wright 'super-Cyclone' aviation engine contains the potential energy of 2,200 horsepower within a diameter of only 55 inches, the same size as that of the original 525 horsepower Cyclone engine sixteen years ago. The early motor had 9 cylinders, the new one 18. Four of the latter will power each of the Lockheed Constellation 60-passenger cargo planes built for the Army Transport Command. What makes this increased power in the same diameter possible? New metallurgy, including aluminum, nitralloy, etc., and a supercharger, so that the weight per horsepower is slightly over one pound. (The average workhorse, we would like to point out, weighs about 1,500 lbs.).

'At the end of the war we will have a tremendous aluminum capacity in Canada, about 12 times that of prewar capacity . . . In about 5 days, at present rate of production we could fill all the probable annual re-

quirement for postwar airplane production.' George C. Bateman, Canadian Metals Controller, in *Iron Age*, 11/11/43. (Are Canada's aluminum plants to be scrapped then?)

## *7000 White Horses*

The world's largest electric motor has just been completed, in America, of course. It was built in one of the only two plants in the nation where it could be built, General Electric's works in Schenectady, the other being Westinghouse in East Pittsburg. The motor weighs 500 tons. It is rated at 7,000 horsepower. It is 44 feet long, 16 feet in diameter and 13 feet high.

Electrical engineers who designed it say the motor could lift a 1,350 ton destroyer at the rate of 200 feet per minute, but it won't be used for that purpose. It is now being installed in a new steel mill (built by Defense Plant Corp. of the U. S. Government) at New Geneva, Utah. Its power will drive machines which are designed to cut 10 ton steel slabs into 200-foot lengths.

What the publicity failed to mention is that this motor will do the work of 70,000 men, a great help in the wartime manpower 'shortage' but a greater help in peacetime toward solving our production problem.

## *What Won't They Do Next?*

Last spring the Division of Forestry of the Illinois Department of planting machine in Mason State

Conservation put into use a tree-forest. The machine is pulled with an ordinary farm tractor and can be operated by one person. Approximately 600 trees per hour were planted. A check immediately after planting indicated that only 3 percent of the trees were improperly planted. And a preliminary check of all plantings during the middle of July indicated an average survival of 88 per cent, which would 'have been better if graded stock had been used. Additional changes are being made in the planting machine, and it is hoped that these changes will increase production to approximately 1,000 trees per hour.'

Three records in electric power had been set in the weeks before this issue

of the *Great Lakes Technocrat* went to press; each record was due to be broken by the end of 1943, however. They are:

1. All-time high electric power generation by U. S. central stations was reached the week ending Nov. 20, with a total of slightly more than 4,500,000,000 kilowatt-hours.

2. In the same week power output of the Commonwealth Edison plants in the Chicago area reached a new record of 195,000,000 kilowatt-hours.

3. On Oct. 26 the Consolidated Edison System stations in New York were loaded with 2,000,000 kilowatts for the first time, and in the following 24 hours output totalled 36,342,000 kilowatt-hours.

Technology Marches On!

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### Room For More Technology

Three to eight million cubic feet of methane gas is being pumped out of the average U. S. coal mine daily. This gas, which is wasted into the air, has a heat value of 100 to 300 tons of coal. *Progress Guide*, 8/43. Any city in the U.S. has in its sewage disposal system methane gas, which can be harnessed to produce on a 50,000 population basis, 2,900 horsepower-hours of labor daily, yet the latest count shows only 180 such sludge engines in use in the country. *Scientific American*, 9/43.

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Dept. of Agriculture figures show that the average U. S. cornpicking machine is made use of only 104 hours a year, or an overall load factor of .01, and the average combine

is in use 127 hours, a load factor of .015.

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'Kaiser (Henry Kaiser, West Coast industrialist) suggests that the government should give new contracts to the manufacturers who produce with the fewest man-hours per unit.' *Business Week*, 9/18/43.

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### Men and Machines

'When men are left to just talk, as they do in Washington, they seem unable to act, and the debate tends to become more ingrown.

*But team up men and machines, and give them a job to do, and your faith in the capacity of the human race rises.'* Raymond Clapper, in his column in *Chicago Times*, 11/24/43.



# A Primer of Technocracy

by Education Division—8741-1

## *Energy is Life*

**I**N the beginning there was energy. This physical force animates and permeates the entire Cosmos. It manifests itself in many forms on various levels of activity and may be called by different names. But, it's all the same primal stuff and can neither be created nor destroyed by any means we know of. Energy is the basic material out of which all organic and inorganic things are composed and by which they move and have their being. In the last analysis, matter itself is only a concentrated form of energy. It is energy at a lower or different state of activity. There is no manifestation of matter apart from energy, or vice versa. Energy is absolutely primary; it permeates all life and activity as we know it on this earth. Finally, being a physical thing, it can be measured and controlled.

Interstellar space is being continuously filled with a constant flow of energy from millions of celestial generators. The sun also has been radiating energy for billions of years. The earth, like all other dark bodies, is immersed in this cosmic radiation and has been receiving, and absorbing, large amounts of it for a long, long time. Of the total amount of energy radiated by the sun, the Earth receives only about one two-billionths part, yet without it this planet would be a frozen, lifeless

waste. About one-third of the energy received from the sun is constantly being reflected back into space, by the belt of ionized gases surrounding the earth's outer atmosphere. Of the remainder, a part is radiated off as spent, long wave heat radiation. Another part is absorbed and used in the processes of nature, such as evaporation, precipitation, wind and other varied manifestations. The balance is stored up in the form of coal, oil, gas, wood, etc.

Estimates of the age of the earth vary. Perhaps it was about one billion years ago that it began. It is likely that the earth was thrown off from the sun due to the tidal pull of some large passing body. This is one of the most commonly accepted views. In the beginning, it was a ball of fire itself, radiating energy into space. Gradually it condensed and became cooler. More than half of all geological time had passed before any life appeared on the earth. That was in the Paleozoic Age, about 500 million years ago. Life began in the warm prehistoric seas. As time went on geological changes occurred, some of the marine plant and animal life became exposed to the dry land, and gradually adapted itself to that environment. Since then, life has assumed a multitude of forms, undergone a great variety of changes and spread all over the earth.

### *Man: Descended or Ascended*

The low-skulled ape-like creatures who were the predecessors of man, appeared on the scene about one million years ago. Several skulls of this man-like ape or ape-like man have been found but the records are scanty. We are not concerned here with whether man evolved from the ape or vice versa. About 250,000 years ago the first true man appeared. He has been named the Neanderthal man. He lived in caves, built fires, left kitchen middens behind him and buried his dead; consequently more is known of him. The Neanderthal man was succeeded by a higher type called the Cro-Magnon. In turn, he seems to have disappeared into the mists, but left behind him paintings on the walls of caves, which retain their colors to this day. It was not until less than 10,000 years ago that some sort of stable social life appeared, based on agriculture. This is the accepted evidence of man's progression and it is fairly well substantiated.

For 500 million years, ever since the earth became cool enough to store energy instead of radiate it, the factor of energy utilization has been basic on this earth. Energy has supported life in all its forms through age after age of slow progression. The exchange of energy between life and its environment has been the physical means whereby such life has existed on this planet. Man, even more than lower forms of life, owes his survival and pre-eminence to his ability to capture ever more and

more energy and to convert it to his own advantage. Regardless of how far back we go in biological, geological or astronomical evolution, we find that energy is the omnipresent determinant of all physical things on this earth.

In the beginning, there was energy.

### *Eons of Scarcity*

When man first learned how to make and control fire ages ago in the misty dawn of social life, he reached the first high point in his long and painful progression on this earth. When he learned the domestication of animals and plants and discovered the use of metals, he passed a few more high points. The use of fossil fuels and the invention of gunpowder marked the culmination of man's progression prior to the introduction of the first practical steam engine. These physical events were interspersed between long periods of barrenness. Each one followed the other in a more or less orderly sequence. Neither did they occur spontaneously. For, in the barren periods in between, there was a slow growth of knowledge of the physical laws of nature. Some of these events may have happened accidentally, as occurred later in the first vulcanization of rubber. But it can be said that the growth of knowledge which enabled man to take advantage of the opposing forces in his environment played an important role.

From first to last these events in the early stages of man's existence marked points at which he learned how to tap into that great ocean of



energy flowing ceaselessly throughout the universe and divert a part of it to his own use. The ability to divert and convert energy from sources outside his own body is the chief distinguishing characteristic between man and the animal world. This ability grew as his knowledge of physical laws increased. The benefits were reflected in his mental and physical status, in other words, his general welfare. By and large, however, the net gain was small. For thousands of years, the yoke of the past hung heavily upon the shoulders of mankind. It was a long, long age

of human toil and scarcity, a never-ending battle for a bare existence. Then came the re-discovery of America. Then came the steam engine. They were equally important, for here in America was found for the first time that necessary combination of geographical, geological, climatic and human resources required to apply the growing knowledge of physical laws to the means whereby men lived, on a grand scale. The stage was all set, and the curtain rose on the industrial revolution.

Next Issue—*Prelude To the Power Age.*

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### ***There Is a Big Job To Do***

'Strange though it may seem, the facts are that from the standpoint of today's technology, the greater part of America's industrial system is now obsolete, and must be rebuilt!' Alfred P. Sloan, chairman of General Motors, in *Steel*, 11/15/43.

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*The present plant equipment of the United States has not been kept up to date. . . . Approximately only 4 percent of the entire industrial equipment of the United States is really modern in design and control. Yet, in spite of this condition, the technological equipment of the United States and Canada constitutes at this time the greatest known social force ever at the disposal of a human society.*

*This force must be organized for a planned objective under a unified control. Industrial mechanization must be installed on a Continental scale far beyond anything that we have known. America must move forward and mechanize to the limit.'*

Howard Scott, Director-in-Chief, Technocracy Inc. in *Technocracy Magazine*, July 1940.

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'The United States is not fighting this war for profit, and hence the government cannot afford to limit its thinking and planning to that of a profit economy.' Lyman Chalkley, head economic analyst of industrial engineering division, Board of Economic Warfare, 2/7/43.

# Technocracy and Your Trade

by Organization Division 8741-1

## *Shades of Samuel Gompers*

While tobacco products of all kinds, including cigars and cigarettes, are being turned out at a rate 35 percent greater than the last peacetime year, 1939, employment in the industry is still on the same downgrade it was marching on before the war.

The cigar unions, once so strong they elected a president to the American Federation of Labor, are no longer important. Machines now shred, mold, wrap, and package both cigars and cigarettes.

When you pay 17 or 18 cents for a package of cigarettes, you are not paying for tobacco nor for labor, as far as most of the cost goes. There is less than 2½¢ worth of factory wages and about 1 1/5¢ worth of tobacco in the average pack. Most of what you pay for goes for taxes, advertising—and in investment in new machinery. About 300 machines of one model (produced by the Link Belt Co.) would, if used at full capacity, turn out all of this year's cigarettes. This year is the all-time high of cigarette production in the U.S.A. about 240,000,000,000 according to count upon which taxes were paid. This does not include the millions being sent abroad to soldiers and sailors by the Government itself.

The first continuous long-filler cigar machine was introduced in 1919 at a time when only 3 percent of the cigars were made by machine meth-

ods. By 1936 the percentage was up to 50 and today the mechanization is greater. This technology, as in the case of other industries, enables fewer factories to turn out as much or more products.

## *That's A Lot Of 'Coffin Nails'*

In 1919 the National Research Project of the WPA stated that 'machines now in use can turn out about 600 cigarettes a minute, and equipment capable of greater speed is being developed.'

The average output per cigarette factory was 200,000,000 a year in 1919 but it jumped to 1,655,000,000 in 1936, and 95 percent of all the cigarettes produced were made by only eight companies, with four of those getting 85 percent of the business.

When was the all-time peak of tobacco products employment? It will surprise many of the 28 year olds now smoking to learn that this peak was reached before they were born, in the year 1914. It was then that cigar and cigarette factories had a grand total of 180,000 employees. Total employment, total man-hours of labor used and man-hours per unit have all been declining ever since.

Latest Bureau of Labor statistics put the U. S. total in August 1943 at 89,000, while in August 1939 a month before this war started it was 91,000. In 1936 the average cigarette worker was producing 4,900 units per hour.



Now it's much more than that and after the war productivity per man-hour will go higher. Human toil and

hand tools have almost completely disappeared from the picture in the tobacco products industry.

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### **Against Fascism At Home**

During the month of August, losses among American industrial workers due to sickness, accidents, and personal reasons amounted to 39,550,000 man-days, according to a report of the National Industrial Conference Board, in a report that did *not* make the front pages where strike news was headlined. This total is more than five times the loss of man-hours resulting from strikes in the first two-thirds of 1943.

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'There is a distinction between drafting men to work in Uncle Sam's shipyards and in drafting them to work in Sam Smith's shipyard, even if Smith is building ships for the Navy. The contractors are running their business for profit, and for the government to draft one man to work for another is entering into a field that savors of privilege and involuntary servitude. If, in the course of the war, it becomes necessary to draft workers, then Uncle Sam should expropriate the plant. It must be Uncle Sam's—owned and managed by him—with not a dollar of profit to any individual or corporation.' Josephus Daniels, former Secretary of the Navy, 4/3/43.

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'American farmers, as represented in the National Grange, are willing to have their entire industry con-

scripted along with manufacturing, mining, capital, labor, and all other resources of the nation, if such universal conscription is deemed essential to winning the war.' *Christian Science Monitor*, 11/19/42.

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'The resolution (passed by the Southern States Federation of Labor) opposed conscription of labor, but stated that if it should become necessary then all industries and places of business . . . wherein such conscripted labor might be assigned work, shall likewise be taken over by the government and operated under supervision of the government, so that "no forced labor shall be used by any private employer for private gain or profit".' *Greater Los Angeles Labor*, 12/15/42.

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The danger in forcing the nation's men and women to work for whatever corporations they are told to, at whatever jobs and hours and working conditions they are given, is in leaving those corporations to continue doing practically as they please.

Would you want to be ordered by your government—on the requisition of corporate enterprisers—to work for America's *Mitsui's*, *Comite des Forges*, *Krupps*, *I. G. Farbenindustrie*, et al?

Representative Harry Sauthoff sponsored a resolution in Congress recently, calling for an investigation of profits in the food industry. It was referred to the House Agricultural Committee. He also demanded that the OPA make public a 'confidential' report showing fantastic profiteering by food wholesalers. The secret report purports to show that meat packers' profits have increased 638 percent since 1939 and general food profits about 600 percent. Attempting to justify the report's suppression, an OPA official is reported to have said that the agency was in the business of curbing prices, not profits.

This is exactly 50 percent correct. No Price System agency ever was or ever will be set up to curb profits. The rule is, if you can't get it one way, get it another. The insoluble mystery of it is this: How can you curb prices without curbing profits? Perhaps the Wizard of Oz knows.

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# TECHNOCRACY

## WHAT?

## WHERE?

## WHEN?

## WHO?

### WHAT?

★ Technocracy is the only American social movement with an American program which has become widespread in America. It has no affiliation with any other organization, group or association either in America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 25 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are \$6.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy—the Monad, an ancient generic symbol signifying balance.

### WHERE?

★ There are units and members of Technocracy in almost every State, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Victory Program with any interested people and Continental Headquarters will be pleased to inform anyone of the location of the nearest Technocracy unit.

### WHEN?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance—a research organization. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

### WHO?

★ Technocracy was built in America by Americans. It is composed of American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this country. Membership is open only to American citizens. Aliens, Asiatics and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife—as long as you are a patriotic American—you are welcome in Technocracy.

**Great Lakes Technocrat,  
306 W. Randolph Street,  
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## *Technocracy Sweeps Canada*

For the first time in three years and four months Technocracy is active again in Canada. On October 15 the Canadian Government released Technocracy from its temporary suspension and, without a moment's delay, the work of reconstructing the Organization, which had been disbanded since June 1940, began. The Technocrats of Canada had waited long and loyally. When the signal was given by the Canadian Government they were ready. Perhaps, to some of the observers, the phenomenon of Technocracy's vitality appeared as a phoenix arising from the ashes, arising from a sacrificial offering which had been made of Technocracy to gods with clay feet. For here was Technocracy again and three years had failed to dilute the enthusiasm of the Technocrats. Within days there was a network of activities from Nova Scotia to the Queen Charlotte Islands.

The ban on the Canadian activities of Technocracy was instituted by an Order-in-Council on June 20, 1940, at a time when Technocracy was reaching a new peak of organization expansion in Canada. On October 15 this ban was lifted unconditionally by the Canadian Government and the act was personally announced in Parliament by the Right Honorable Mackenzie King, Prime Minister. Technocracy is now restored to 'all property, rights, and interests in Canada.'

Because of the fact that the Organi-

zation had consistently and sedulously observed and obeyed all laws and regulations of Canada and was never charged with any infractions, it is restored to full operations with the approval and respect of the Canadian public. The total membership of Technocracy in Canada was cancelled by Continental Headquarters on June 30, 1940, and it is significant to note that amongst the flood of new membership applications a large number are from those who were never members before!

The Technocrats of United States and their friends salute the integrity and unswerving loyalty of thousands of North Americans residing north of the Great Lakes and the Forty-Ninth Parallel whose fortitude of purpose has carried them through this period of national trial. The Technocrats of United States and their friends salute those valiant thousands who have refused to be discouraged, who have declined to be intimidated, who have maintained the ideology of the world's greatest social objective. To these valiant thousands in their unswerving loyalty to the only social dynamic of this Continent, the Technocrats of United States can only say: 'Well done, Canadians! This Organization in its entirety moves forward continually and without compromise toward its great Continental social objective for the benefit and security of the population of this Area.

*Continental Headquarters*



# GREAT LAKES TECHNOCRAT

25c

MARCH-APRIL, 1944

25c

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Illustrating the Futility of Price System Methods of Operation; Interpreting the Trend of Events from the Social Aspect of Science; and Presenting the Specifications for Total Victory in America's War Against Fascism.



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# I Am the Price System

by The Peripatetic Technocrat

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Everybody knows the Price System. We all have dealings with it every day of our lives, from birth to death, and there is no escaping it this side of the River Styx.

It dictates nearly everything we do and controls almost everything we use except the air we breathe. The only reason it can't interfere there is because air is abundant. Here is its autobiography, written by the old miser itself.

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## *Always With You*

I HAVE existed since the beginning of social life yet few men recognize my fundamental characteristics. With the exception of some minor civilizations here and there, I am the only type of Social System that has ever existed. I was conceived in Human Toil and Scarcity and dedicated to Profit and Waste.

Before recorded history began I laid down the foundation of my system in the early tribal life of mankind. In the Ancient World they called me Chattel Slavery. The glory of Greece and the power of Rome was rooted firmly in Human Toil and Scarcity. During that long night of the human mind called the Dark Ages I was known as Fuedalism and Serfdom. In the modern world I am called Capitalism and they even entitle me Democracy in certain nations. Of all the names I have borne, the most misleading of all is that

given to me in Russia. There they call me Communism.

My name has been changed many times but essentially I have remained the same in all countries and times, except that my techniques have improved.

*I am any social system whatsoever that effects its distribution of goods and services by means of any system or trade or commerce based on commodity valuation and employing any form of debt tokens or money.*

For uncounted generations I have held sway in every Nation over the bodies and minds of men. Today I still exist all over the world in various stages of development, controlling the production and exchange of goods and services and all the means whereby men live.

I am the group expression of man's common urge to live and prosper at the expense of his environment, even

including the human components thereof. I am the resulting social system under whose regimentation every man is forced to give as little to society and his fellow man as he can get away with and take back as much as he can get.

I am the law of the jungle (eat or be eaten; kill or be killed), projected by mankind into institutional forms. I am the lowest common denominator of the ability, intelligence and necessities of mankind.

### *Mood of Confession*

Early in social life I discovered that values could be determined by the force of human desire and that desire itself was determined by Scarcity. Value and Scarcity are therefore the cornerstones of my system.

I dressed them up so that men would not recognize them and baptized them Supply and Demand. In this guise they have befuddled men for ages. I had my economists tell them that Supply and Demand were natural laws and dictated Prices. This took the moral blame off my system and created the impression that nothing could be done about it.

Supply and Demand has been a useful myth to my System. Behind its cover I have always restricted the supply and made it a practice never to allow demand a free avenue of expression. Actually, there is no ceiling to supply except ability to pro-

duce and no limit to demand except ability to consume. But I cannot afford to let it become generally known that there are no natural laws except physical laws.

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**What was the first discovery that savage man made after he came together in social life? It was the elementary one, still valid, that other men placed a premium on scarce articles. This was the beginning of 'Chiselocracy.'**

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After this original discovery, I found it necessary to have more tools to work with. So I invented a promise and called it I Promise to Pay. This has turned out to be a neat device. I Promise to Pay can be neither seen, tasted, heard, felt or measured. I conjured it out of nothing and planted it in the minds of men. It took root and grew there with lush abundance.

I Promise to Pay was the first of a long list of operating devices I invented to facilitate the functioning of my system. They were all conjured out of nothing, with no basis in physical laws, yet they have become the Rules of the Game under which my System operates.

Next, so that men would not recognize the non-substantial nature of my Promise, I fashioned real tokens to represent it. These I called Money. Since Money is the token of a promise, it is a Debt Token. It has no ultimate reality in itself but only in



what it represents, which has no reality at all. Money is the promise of I Promise to Pay, when, as and if. *It is the Nothing you get for Something before you can get Anything.*

It seemed necessary to camouflage the real nature of Money, so I gave it another name called Medium of Exchange. This has a respectable sound and besides that it is actually how Money functions. It is not, however, a medium of distribution as some of my apologists assert. My system, *The Price System*, is not interested in distribution. It functions solely to exchange goods and services on the basis of scarcity determined values for a profit, and any distribution that results is an unavoidable by-product.

It became apparent at once that Money functioning as Medium of Exchange possessed certain characteristics useful to my system. It is negotiable, transferable, interest-bearing and can be saved. All this allows it to be traded in, stolen, given or gambled away; and since it is not a measure of anything real and fixed, it can be devalued, revalued and manipulated in countless ways.

This variability is necessary to the existence of my system. There must always be a free flow of Medium of Exchange, else the arteries of commerce will dry up. In addition there must also always be an ever present natural or artificially maintained

scarcity, else values will collapse and there will be no basis for exchange.

### *I Have Much To Confess*

The way my System is organized it is compulsory for the individual to accumulate as many Debt Tokens as possible or else become a public charge. There are three major compulsions involved. First, because of the negotiability of Medium of Exchange, it constitutes a debt claim against my entire system, or society at large, as my Debt Merchants say. Second, also because of its negotiability, Money can be exchanged for any goods and services available. Third, again because of its negotiability, it constitutes a potential working force which can be hired out at stipulated rates of increment stated in terms of itself, thus increasing in size and power. When used this way, Medium of Exchange is called Capital. Once an accumulation of Debt Tokens has reached the proportions of Capital, it becomes compulsory to keep it out working all the time. Its tendency is to shrink back into the nothing from which it came. It must either increase or die.

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**If all the gold at Ft. Knox were dumped in the ocean would production stop? If not what is it based on, mercenary motives or social necessity?**

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The purpose involved in my entire system is for the individual to acquire as many Debt Tokens as possible and thus acquire a larger lien on I Promise to Pay. One must pile up debt claims against his fellowmen faster than they can pile them up against him. One must be either a horse or a rider, a chiseler or a sucker. It's dog eat dog all the way through.

During my checkered career I have performed such a complexity of manipulations with Medium of Exchange that dozens of schools of economists have arisen around my antics. Each one claims his theory of Money is correct. That is why economics can be correctly defined as the study of the pathology of debt.

Previous to the invention of Medium of Exchange, my activities had been restricted to direct barter and outright theft. I have never really outgrown these time-tested methods of lightening the suckers' burden. I merely graduated into improved techniques. In these more refined, modern days, whenever a situation calls for primitive methods, I always seize the opportunity to keep in practice. There's nothing like having something solid to fall back upon, should a rainy day come.

### *I Begin To Feel My Oats*

The device of Capital allowed me to put into effect Delayed Exchanges. This opened up a whole new world

for expansion. I brought Capital and Delayed Exchanges together in natural wedlock and they begat Debt, Interest, Profits and Waste. These are the four horsemen of the apotheosis of my system.

Debt grew up like Milo, getting bigger all the time. His little brother Interest accompanied him wherever he went and always managed to pick up a little something on the way back. Every so often Profits got lost among Delayed Exchanges but Debt and Interest always went out and brought him back. Waste operated everywhere expediting the turnover of Delayed Exchanges and thus helped to maintain Scarcity.

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**'Waste not want not' has been translated by business to mean, 'Waste not profit not.' No business ever reaches great success without well planned waste. It's indispensable to the Price System.**

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Once when Delayed Exchanges seemed to be turning over too slowly. I brought Waste and Profits together in illicit relations. They begat Cheap Substitutes and Shoddy Goods. Delayed Exchanges turned over much faster after that; and Scarcity became more pronounced.

But, alas! Debt turned out to be allergic to a natural enemy called Paid in Full. Every once in a while this pest turned up and I was forced to create New Debt. After some ex



perimentation, I devised an improved type of Debt called Long Term Debt. He resisted Paid in Full much better.

So with Scarcity, Values, I Promise To Pay, Medium of Exchange, Capital, Delayed Exchanges, Interest, Long Term Debt, Profits and Waste, I was almost all set for a successful and endless career.

### *Jungle Law Comes To The Jungle*

There remained two things to do. I had to have an institutionalized social structure, superimposed upon these operating characteristics so as to consolidate my gains and maintain law and order. Also it was necessary to camouflage it so that men would take it for everything else but what it actually is. How successful this effort has been only a thermodynamic interpretation of history will reveal. Radicals, liberals, moralists and humanitarians have tinkered with my superimposed social structure for ages without altering or affecting its basic operating characteristics one bit.

To tell the truth, I did not design these social institutions as one job. They grew up naturally over a period of time as a normal outgrowth and corollary of the basic system of trade and commerce underneath.

In the very beginning of social life men had come together in groups for the purpose of multiplying their strength against the opposing forces of their environment and thus obtain-

ing individual security more effectively. This is the original reason for the formation of tribes and communities of people. One might put it this way: The paramount concern of the social state is supposed to be the general welfare of the human components involved.

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**There are two kinds of laws in society, physical laws and legislative laws. Physical laws can't be violated, they operate willy nilly. Legislative laws are passed because it is known in advance that they are being, or will be, violated. U. S. Supreme Court Justice Benjamin Cardozo once said: 'The purpose of the law is to preserve the ancestral smell.'**

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How I subverted social life from its paramount purpose is a story in itself. It runs concurrently with the gradual development of my operating tools for production and exchange of goods and services. For the superimposed social institutions are but a reflection of the fundamental means whereby men live.

Briefly, those who learned how to chisel according to the opportunities provided within the framework of my system became a ruling oligarchy. All men, of course, could not do so but only a minority. For, where there are exploiters, there must be some one and something for them to ex-

plot. In any event, while Natural Scarcity prevailed, which was the case for many thousands of years and is still so in most of the world, there never was enough to go around and provide every one with what he needed. So, if that part of the physical wealth which went to the ruling oligarchs had been divided among the great mass of people, it wouldn't have made much difference.

All throughout history my system has been operated and controlled by three oligarchies. First, came the oligarchy of organized Government to maintain my law and order. Next came the oligarchy of the priesthood and medicine men who preached submission to my system and reward after death. Last came the oligarchy of the entrepreneurs who operated my system of trade and commerce. These three have alternately either controlled separately or worked together in all countries. I have named them Ecclesiasticism, Private Enterprise and the Political State.

Their role today is the same that it has always been. Organized government is necessary under any social system. Since the first concern of any government is to maintain itself, mine is no different from what any other form of government would be in that respect. It protects its own, i.e., the *Price System* of production and exchange.

Private Enterprise functions to ex-

plot the natural resources of the land and the human components thereof for all the profit the traffic will bear. It is easy to see how the interests of my three oligarchies tie in together.

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**'I often say that if you can measure that of which you can speak, you know something of your subject; but if you cannot measure it, your knowledge is meager and unsatisfactory.'**—Lord Kelvin.

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### *Such Stuff As Dreams Are Made Of*

The last factor which adds to the strength of my system and its resistance to change is the set of sugar-coated Abstract Concepts that has been woven into it by my philosophers and historians. I conjured these empty ideas out of nothing. The proclivity of men to become enamored of visionary conceptions is truly amazing.

Abstract concepts are composed of symbols in the minds of men which are *not* reflections of real things in the physical world about him. For example, the mental symbol 'horse' represents something real in the physical world, that is, 1500 pounds of flesh and bones on the hoof. Thus, it is a Real Concept. To prove it, you can perform an operation to demonstrate its reality. You can describe a horse with words, i.e., other symbols, and then go out in the



physical world, find a horse and show where your verbal description fits the real thing.

If every single real thing in the physical world had its symbol in the minds of men, there would be an even number of symbols and things and no more. All mental symbols would be Real Concepts. Such is not the case, however; the minds of men in addition to being able to contain Real Concepts can also entertain an apparently limitless number of empty symbols which represent nothing in the physical world.

This fact is one of the main props of my system. Over a period of time my philosophers, and more lately that frustrated breed of psychotic complexes called the Liberal, have invented thousands of Abstract Concepts to intrigue the minds of men. Among these are Liberty, Freedom, Equality, Fraternity, Justice, Natural Rights and Survival of The Fittest, Right, Wrong, Morals, Ethics, Sin and so on. Try to perform an operation to prove the existence of any of these concepts in the physical world of reality and see how far you get.

I am not afraid of these Abstract Concepts because, not being physical entities, they can be and are clothed in ever shifting definitions and can never be united on any common basis of agreement. They can never harm my system and they're very useful. The intensity of their hold upon the

minds of men is so great, however, that they will face blazing machine guns in defense of them even though they don't exist. Whether men will go as far in the furtherance of Real Concepts remains to be seen.

Abstract Concepts help to conceal the real nature of my system. They keep men busy ever seeking to attain that which is unattainable. If you will analyze my system closely, you will see that in its physical operations to produce goods and services, it conforms to some physical laws. But in its exchange of this physical wealth, it ignores physical laws and the control is carried on by methods devised out of Abstract Concepts, or nothing. No wonder it jams up every so often.

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**Exchange value is a function of scarcity. When scarcity departs the concept of exchange value collapses, revealing its abstract nature. Therefore under a Price System we are actually rich in inverse proportion to what we don't have, in goods and services.**

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As long as Scarcity lasts, my system can operate. But when Abundance enters the picture, Scarcity and Values both disappear and all the Abstract Concepts of my system will shrink back into the nothing from whence they came. When this occurs, Real Concepts will enter the picture and then men will discover for the first time what I have known all

along. That is, that the benefits they have been seeking for ages in Abstract Concepts never did reside there at all but always were waiting to be found in Real Concepts derived directly from the physical world around them.

### *Abundance Haunts Me*

Of all the Real Concepts there are, the one called Abundance for Everyone makes me shiver every time I hear it. Those words contain my death warrant. As I look back now, I can see that my troubles began in 1782 A.D. when the first double-acting steam engine was developed. Oh! If I had only known then what I know now. I would have been absolutely ruthless in the eradication of Science and all thoughts concerning Science.

For I was just then enjoying the tail end of a thousand year moratorium on change. My triple oligarchy, Ecclesiasticism, Private Enterprise and the Political State had installed and maintained this glorious period in my name. Historians call it the Dark Ages, but to me it was the Golden Age of the Price System. There were no upsetting thoughts about Abundance For Everyone then. Men were content to work away from sun to sun for the greater glory and profit of their masters, assured of suitable rewards hereafter. The few heretics who dissented from my sys-

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**Who discovered the use of fire, and how; who discovered the principle of the wheel; who first smelted iron ore? Thousands of contributions to the advance of scientific knowledge were made by countless known and unknown men. Ask yourself, who owns science?**

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tem were quickly taken care of in medieval torture chambers and at the stake. Long success had made me lax and I had forgotten that underneath the superimposed social structure, hoary with folklore and ancient traditions, Scientific Knowledge was increasing.

In the Ancient World, Scientific Knowledge had gotten off to a respectable start in Greece and at Alexandria. But the legions of Rome and the fanatical followers of Mohammed soon had the situation well in hand. Then I froze the status quo for a thousand years. It seemed good enough to last forever. Men, however, were discovering physical laws and learning how to apply them. Apparently even my *Price System* can't stop men from thinking and experimenting.

### *I Am Outflanked*

By the time the 18th Century rolled around, this growing body of knowledge had spawned the witches' brew of Science, the Scientific Method and



the Scientific Attitude. Inventions were made and existing knowledge of physical laws applied therein. Machinery came into being, crude and cumbersome, but more efficient than my age-old methods of Human Toil and Hand Tools had been. Some unknown enemy of mine discovered that any motion that is repetitive can be performed better by machinery than by human hands. Then the factory system of production was born and my arch enemy Technology entered the picture.

Coincident with these developments came a greatly increased use of power derived from sources outside the human body such as coal, oil, gas, wind and falling water to turn the factory wheels. Without this latter development, Technology would not have attained its present estate. Though, of course, Technology and Extraneous Energy are more or less the same thing, like identical twins. The conversion of Extraneous Energy to use it for power was new and revolutionary.

All throughout my long history, the only source of power available had been the human body supplemented by crude windmills and the power of work animals. So, the only way to produce more was to employ more men or work longer hours. The average power of a human body is one-tenth that of an average horse. In 1782 the first double-acting steam

engine developed many times the power of one horse. So the industrial revolution began and I, poor fool, welcomed all this.

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**When George Washington drove the 250 miles from Mt. Vernon to New York City for his inauguration the journey required seven days. Today one can reach any place on earth in less than three days. Horse power ideas, too, belong in the horse-power age.**

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Had I foreseen the ultimate results of the impact of Technology and Energy upon my *Price System*, I would have put a stop to it in its early stages. Now it's too late. Science has grown to gargantuan proportions and men have become dependent upon the machines they have created. The best I can hope for now is to revert to some intermediate stage of development and freeze my system there. In fact, I have been staging a powerful attempt in that direction lately in Europe and Asia. I call it Fascism. It's my only hope.

There is no one to blame for my present predicament except myself. I have been a partner to my own downfall. Of all the heretics, liberals and radicals spawned by every protest movement in history, none have given me such cause to worry as my own stupidity. The operating devices which worked so well for so long don't seem to work so well these days.

This has been more true in North America than in the rest of the world. Here, Technology and Energy have advanced further than anywhere else.

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**'When I use a word,' Humpty Dumpty said, 'it means just what I choose it to mean — neither more nor less.'**—Lewis Carroll.

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### *I Go On A Long Spree*

In the beginning of the Industrial Revolution, I enjoyed expansion, such as had never happened to my system before. I spread into the furthest corners of the earth. I modernized my operating characteristics and added refinements unknown in the simpler Agrarian-Handicraft stages of the past. Any Debt Merchant or Economist can reel off the list for you. They study the pathology of my operating devices (which you will remember were conjured out of nothing) without ever inquiring into their essential nature. That is because these gentry are well chosen for lack of perspicacity. But at least they are familiar with the new nomenclature.

When expansion began I saw at once that Private Enterprise needed a few more Abstract Concepts to assist it. So I conjured up the following: Live and Let Live, Competition Is The Life of Trade, Individual Initiative, Plan of Plenty, Rugged Individualism, Niggardliness of Nature, Law of Diminishing Returns, Business Responsibility and Free Enterprise.

They sound beautiful and have functioned well, but I can assure you they are as hollow as a puff ball.

When the Political State saw Private Enterprise expanding into Corporate Enterprise, it too had to modernize. So I added a set of Abstract Concepts to it also, such as: Political Democracy, The Voice of the People is the Voice of God, Government of Laws and Not of Men, Equality Before the Law, Freedom of the Press, Freedom from Want, Freedom from Fear, and so on. Any politician can reel off the list for you. They're always spouting about these Abstract Concepts.

If you study history closely, you will find that these latter day Abstract Concepts came in with the Industrial Revolution. They are now part and parcel of my operating characteristics. If you will examine them carefully you will see that they cannot be worn as clothes to keep out the cold nor eaten for food to nourish the body. They are in all respects negotiable the same as Money, and can be and are bought, sold and traded in on the open market.

### *Malthusianism Outwitted*

One of the first effects of the Industrial Revolution was an upsurge in population. It was possible with the new power and Technology to produce more commodities. Thus, it was possible for a larger number of men to live. This trend has continued. For the first hundred years or so of the new order, it didn't matter. Industry was expanding and the birth rate of new jobs was always



greater than the death rate of old jobs, eliminated by the advance of Technology. If I succeed in reverting to a lower stage of industrial development and freeze social change, it means that the population will also have to be decreased to the number that can be supported by a less advanced stage of production.

In one country, Russia, composing one-sixth of the world's land area, two members of my triple oligarchy were kicked unceremoniously out of the picture by a political revolution in 1917 A.D. These were Private Enterprise and Ecclesiasticism. However, the Political State took over their functions and I still operate the same old way there. My stage of development there can be defined as State Capitalism. It functions the same except that Private Enterprise has become State Enterprise and Ecclesiasticism has been emasculated to a great extent. However, the Technology of Russia is growing rapidly and I fear the worst.

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**Fascism is a network of compulsions in economics, government and religion, designed to freeze social change and maintain the ancient status woe. It is the consolidation of all minor rackets into one major monopoly for the benefit of wealth and privilege.**

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Most of the world is still in the first or second stages of the Industrial Revolution, and it shouldn't be too hard to retard social change there. These backward nations do not possess enough natural resources to de-

velop much further. I, the *Price System*, can still operate according to the old formula there. Perhaps a federation of some nations based upon the location of natural resources could arise. That would make conditions uncomfortable for me. The Political State in every country, however, is prepared with a powerful Abstract Concept called Nationalism to oppose any change. The jujitsu of my Abstract Concepts is potent, even if they themselves are not real.

### *Look Down That Lonesome Road*

As I survey the world today, I find one Continent where I am in extreme danger of liquidating myself in the very near future. I am not one to cast blame for my failures upon others. No political ideologies or economic utopian nostrums can alter the basic operating characteristics of my system one bit. Their proponents make good scapegoats but my real enemy is the fact I, the *Price System*, cannot adjust myself today in America to the impact of Technology and Energy.

In the past when things got tough for me in any country, I could always start a war and channelize social change into homicidal conflict. In the past 3500 years, I have had one or more countries at war for all but 330 years of that time. Corporate Enterprise, particularly benefits greatly in time of war. Prices rise, business booms and profits mount higher. The Political State too has an opportunity to expand its powers and prerogatives. Ecclesiasticism, of course, func-

tions on both sides in every war. As a general rule, the same can be said for Corporate Enterprise in these days of International Bankers, Cartel Agreements and World Commerce. Technology, however, has made war too expensive for me. Not that I mind the killing, but the financial problems are a headache. Worst of all, modern wars are waged with the tools of Technology and (woe is me) the tools of Technology are the tools of social change.

In America, today, the more Technology and Energy that is introduced, the more insoluble my problem becomes. It seems that they function everywhere to defeat my purpose to maintain Scarcity and Values. They increase Profits but make it ever more and more difficult to reinvest Profits. They raise the Debt too high and lower the Interest Rate too low. They increase production and decrease employment. They cut down Purchasing Power and raise up a whole host of new social problems that never existed before. They flood the land with Goods and Services, but dry up the free flow of Medium of Exchange. They close the door on Scarcity, but open it for Abundance For Everyone, thus seriously threatening to destroy Values.

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**The efforts of the Price System to stop the impact of technology are as futile as the labors of Sisyphus. The only solutions are to stop technology; or realign the social structure in conformity with physical laws.**

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All this, in spite of my best efforts at Monopoly Control, Restricted Production, High Prices, Shoddy Goods, Buried Patents, Cartel Agreements and Financial and Political Interference. Moreover, the struggle for survival of Private Enterprise makes compulsory the installation of ever more Technology and/or Extraneous Energy.

### *If A Balloon Goes Up Too High*

No matter which way I turn, in America, there is an impasse. The task of creating new Debt in the face of its rapid liquidation and the expense of new Technology becomes ever more and more unbearable. About 1932 Corporate Enterprise gave up the struggle to create New Debt and passed that responsibility over to the Political State. This Lieutenant of mine, as strong as he is now, barely staggers along under the growing load. Perhaps I can solve that one particular problem at least. Debt, if you remember, is created out of nothing. It can also be dissolved back into nothing. I pulled that stunt once before in Germany. It's called Inflation.

Political State increases the amount of Money in circulation until it becomes dirt cheap. When the total amount of Money becomes many times greater than the total Debt, the relative position of Debt is reversed compared to what it was before. It is then small in comparison to Money. So the Debtor takes this Legal Money to his Creditor and pays off his Legal Debts at a fraction of their former



worth. It's a legal swindle, but so what? How about I Promise to Pay, you ask? Well, I told you, it was conjured out of nothing, didn't I? Under Inflation, Private Enterprise performs hari-kiri, for the good of all and then I start all over again with a brand new Private Enterprise.

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**Science is a fair palace of lofty dimensions. It stands properly ordered and rock solid, upon the enduring base of its postulates. Criticisms originating outside its postulates are categorically absurd.**

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That won't solve my entire problem in America though. This Continent possesses 78 percent of the world's installed horsepower of machinery, 73 percent of the world's graduate engineers (those damnable brats of Science who are forever designing new Technology), 19 percent of the World's land area, the largest body of technicians and skilled personnel on earth, the lion's share of the World's natural resources and only 10 percent of the World's population. All this adds up to trouble for my System, the *Price System*, of production and Exchange of commodities.

The installation of ever more and efficient Technology in America, which has been accelerated by World War No. 2, makes Scarcity ever harder to maintain and tends to dry up the free flow of Medium of Exchange. If you remember, these are the cornerstones of my system. As more and more efficient Technological Mechanisms are introduced, man-

hours per unit of Production are constantly driven lower. This spells disemployment of labor and decline of total Purchasing Power. The less Purchasing Power, the less Production. The less Production the less Purchasing Power.

### *I Have To Expand Or Contract*

So it becomes necessary to create ever more New Debt to pay for the installation of still more efficient mechanisms to cut the costs of Production and grab a share of the dwindling market. The new mechanisms, however, pay off the Debt so fast that I'm left holding the bag every time. Reinvestment in new industry becomes ever more necessary and ever more difficult.

The birth rate of new jobs created by Technology has long since dropped below the death rate of old jobs destroyed by the same cause. From 1860 to 1914 in America, my Debt expanded at a compound Interest Rate of 5 percent annually. But physical Production expanded at a compound interest rate of 6 percent annually. The Debt was always healthy. Since 1914 the reverse has been the case. Physical Production has risen to a peak and leveled off but Debt is going straight into the high heavens. Since 1932 when Private Enterprise dumped its Debt-creating prerogative onto Political State, the curve of industrial Production has been following the curve of Government spending like a hound dog follows a coon.

As I said, it's not a problem of finances; it's a problem of how to

maintain physical Production at a high level so as to maintain Purchasing Power and thus maintain the free flow of Medium of Exchange. If I allow physical Production to be maintained at a high level, I destroy Scarcity and if I don't, I dry up the flow of Medium of Exchange. Oh, riddle of riddles! How can it be done? If I inflate the Money, I may destroy all of the little remaining confidence in me and thus seal my own death warrant. I got away with it in Germany only because that country was less advanced industrially and could recover rapidly and resume expanding under my methods.

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**When the first savage reached for a stick to scratch his back with, technology was born. It has been a long time coming of age. But now it's here, and we can either make room for tomorrow or pay the penalty. This generation of Americans has a rendezvous with destiny.**

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In America, the problem of Production is solved. The Technology is installed and can do the job of distribution of Abundance For Everyone whenever my interference controls are removed. My problem is to stall this off as long as possible; and to devise ways and means to freeze social change on a low level. I don't care if it does involve killing off 50 to 75 percent of the population of America. What is that compared to my beloved Oligarchies, Private Enterprise, and the Political State!

## *The End Justifies The Means*

Since I was conceived in Scarcity and dedicated to Waste I am utterly without scruples. I know very well that the prosperity I am enjoying now while America is engaged in the most fateful war of her history is only transitory. I know that it has been bought at the terrific risk of installing a greatly expanded Technology. I know that when the war is over I will be faced with problems such as I never had to contend with before.

I know that scientists and engineers have been analyzing my operating characteristics and have pointed out every flaw. I know too that a more efficient social system has been designed which will distribute Abundance and Security To Everyone. But even though I know the handwriting is on the wall I have not lost hope. My collapse, and the victory of Technology, is *not* inevitable.

If I cannot rule I can always ruin. If I go down I may be able to arrange things so as to carry all civilization in America with me. But even if Chaos results I will not disappear. Out of that Chaos I will then arise again like Phoenix from its own ashes. For I have been with you a long time and I have learned many tricks. History records the disappearance of eight different civilizations of the past. The causes are obscured in the mists of antiquity. But history has never yet written the record of one single collapse of my system of trade and commerce, The *Price System*.



There is only one thing that can liquidate me permanently. That is the replacement of my *Price System* methods of control devised out of visionary conceptions by Technological methods of control devised out of the reality of physical laws. But it has never been done before and due to the nature of Technology it must be accomplished peacefully. How difficult this is going to be a glance at my record will reveal. I loathe Peace. As I look into the immediate future I can gather strength from the realization that I am not alone. I have many able allies who work unceasingly in my interests. Some of them have been with me a long time.

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**Social change in the past could only be accomplished with violence. Social change in the Power Age can only be accomplished in peace. The Achilles heel of technology is social violence.**

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### *History Speaks Highly of Me*

I am the Neolithic man who bartered pretty sea shells and rare stones for food and drink and a place by the fire. I am the tribal medicine man who charged a fee for exorcizing the devils. I am the slaves of Egypt who built the pyramids; and the Pharaohs who were buried there many centuries before my system expanded into Europe. I am the oligarchy of Athens who poisoned Socrates. I am Judas who betrayed Christ; and the Phari-

sees who crucified him. I am the legions of Rome who conquered Greece; and the fanatics of Mohammed who burned the library at Alexandria. I am the Inquisition that persecuted Galileo; and burned Bruno at the stake. I am the radicals of Paris who beheaded Lavoisier: 'The revolution has no need of chemists.' How true from my point of view. I am the mob that shot Elijah Lovejoy; and the Political State that hanged John Brown. I am the brass hats who framed and convicted Billy Mitchell. I am the Capital Investment of the aviation industry which is holding back the adoption of the Flying Wing type of super-bomber in this hour of America's need.

### *My Upholders Are Legion*

I am the esthetes who revel in the delicacies of life that are beyond the reach of the great majority. I am the privileged few who are free to enjoy the fresh air and sunshine, the green meadows, streams and mountains of America. I am all the pot-bellied beneficiaries of my system, whether in broadcloth or overalls. I am also the stolid, patient, underfed worker; and the fat dowager who eats too much and talks too much. I am the miseducated, smart fool who knows all the wrong answers. I am the white collar snobs, the vice-Presidents and Honorable stooges who snub those in more plebian walks of life; and the peasant psychology of the underdog who looks up to Society instead of around at it. I am the myriad of non-producing personnel in all industries

who thrive on the institutionalized red tape of my system.

I am the grand mansions on the Avenue where they will try anything once; and I am the bleak, filthy slums where minds and bodies are dulled by incessant poverty. I am the Park Avenue playboy; and the procurer who hangs around taverns. Their methods differ in degree but not in kind. I am the mink coats of the night clubs. 'You can smell them as they go by.' I am all the 'Nice' kind Christian people of America. How they love to be discreetly dishabile, but not enceinte; and how their hearts can bleed for the poverty stricken children of India, China and all other points 12,000 miles away. I have been spawning them for four generations and today they are 'Nicer' than ever. I am the Banker (Debt Merchant) who never knew anything about his own commodity except how to take a dollar and lend it out at 6 percent interest.

I am the housewife in a constant dither to keep up with the Jones'. I am that monstrous anachronism the father and mother who enslave their beloved children to their own narrow horizons in the 'sacred' name of parenthood. I am the church bells ringing on Sunday morning; and the smug ecclesiastic who rationalizes fear of the unknown into reward after death. My voice is heard plainly in schools and colleges throughout the land; and I am the school teacher who 'cannot lead a normal life unless he, or she, goes to another town under an assumed name.' I am the professors of Liberal Arts and The Hu-

manities; the smooth sophistries of the philosophers; the crackpot dreams of the Utopians; and the poisonous acid of class warfare.

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**'Behind all these men you have to do with, behind officers and government, and people even, there is the Country Herself, your Country, and . . . you belong to Her as you belong to your own mother. Stand by Her, boy, as you would stand by your mother.'**  
—Edward Everett Hale in *The Man Without a Country*.

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### *Divide and Conquer*

I am the shivering newsboy on the corner peddling his daily trash; the writer who composes it; the editor who polishes it up; the publisher who puts it out; the advertiser who pays for it and censors it; and the dumb sap who believes what he reads in the papers. I am the hard-headed tycoon of industry who imagines his club of economic insecurity is executive ability; and I am the Caspar Milquetoast who is afraid to think out loud. I am the law at the end of the policeman's nightstick; the politician who tells him how far he can go in enforcing the law; I am the hired gunman and thug; and the stool-pigeon who puts the finger on my scapegoats. I am also the clever lawyer who inveigles Justice over to the side with the most Money.



I am all the minority pressure groups seeking preferential advantages at the expense of other minority groups; and I am the peoples' representative who caters to these groups. I am the cash-register concept of social values of the smart business man; and the class hatred of the ideologists of dialectic materialism. I am the engineer and scientist who is more interested in personal gain than in social results. I am all the commercial escapisms of modern society, from the moronic movies to the equally moronic but \$30,000,000 a year comic strip industry. I am the millions of adults and children in this country who cannot even read and write. I am the incalculable inertia of the great mass who never do anything about anything unless they are driven to it.

I am the social system and in-

stitutions designed to fit the Agrarian-Handicraft cultures of other lands, imported from across the ocean and superimposed upon the Great Technology of America. I am the folklore and hoary traditions of 7000 years of human toil, hand tools and Scarcity. I am the 'common sense' of the ignorant crowd; and all the superstitions of the unknown. I am every chiseler looking for a sucker; and every sucker who would like to be a chiseler. I am everyman everywhere with a hamburger sandwich psychology of living standards, in the richest Continent on earth. I am all those who know better but do nothing about it.

I am *YOU* who are reading this article. What have you ever done that conflicts with my interests? With such able allies it will not be easy for Technology to effect my collapse.

***'I AM THE PRICE SYSTEM.'***

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### ***Pro Bono Publico***

'Fundamental adjustments in the economic order are necessary and we must move from the competitive struggle to co-operative enterprise—,' Bishop G. Bromley Oxnam resident Methodist bishop of the Boston area at the Illinois Federation of Women's Clubs meeting in the Sherman Hotel, Chicago on May 26, 1943.

According to the account which appeared in the *Chicago Times* of that date the Bishop also stated as follows: 'In the economic system of the future, a man's standing in the community must be based upon the

service he has rendered and not upon the possessions he has acquired.'

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'Then only will the economic and social organism be soundly established and attain its end, when it secures for all and each those goods which the wealth and resources of nature, technical achievement and social organization of economic affairs can give.'

—Pope Pius XI's World Letter on Economic Order.

# Sharp and Flats

by Robert M. Yoder

Reprinted by permission of *The Chicago Daily News*  
Friday, July 30, 1943.

I SUPPOSE that is goes without saying that the great tool of modern times, the symbol and source of what we are and will become, is the factory. That is why I tell in some detail about a factory I saw the other day—one of the new super-colossal plants, built to produce for war. As I say, it is new, and, therefore, the designers could incorporate everything they know about building factories, as of 1943. And while the plant is all but finished, it was only partially operating, which affords an exceptionally good view.

The most impressive thing, I found, are not those usually emphasized. This plant, a division of the Chrysler Corp., includes one building that covers nearly 80 acres, and is the largest single factory building in the world. That, it was interesting to discover, is singularly unimpressive. What is more impressive is the fact that this huge room, with row on row of beautiful sleek machine tools, could just as well be twice as big. They stopped at 80 acres only because they wanted to stop there. Using the same kind of long shed-like sections, they could have run the thing right over into Indiana.

This will be a factory, apparently, where almost all the work is skilled work, but when you see the machinery standing idle, the impressive thing is the amount of skill or talent

that is assembled there before the workmen arrive—the mechanical talent. Here is a tool that feels a part with metal fingers, and carves another exactly like it. How long, and how clumsily, would a man work to acquire the skill that machine is born with?

Here is another into which they thrust bars of red hot steel. The machine's jaws chomp once, twice, three times, and they have moulded the hot steel into part of an airplane motor. Obviously, it shortcuts many hours of carving and grinding. A couple of men equipped with cookie-cutter-like little gadgets are the equal of giants.

You roll through the 80 acres of machine tools and assembly lines on a little bus, moving fairly fast because there is nothing unusual to see. That is what is impressive, if I can make myself clear—the fact that all this is nothing unusual. Here they stand, the machine tools, as commonplace as corn in a field, as repetitious, as boring. But what as assembly of robots this is! Able, talented, clever, with all the electricity in the Grand Coulee for muscle, and overhead carriers to tote and lift what men can't. Like this observer, you may not have the slightest idea what they do, what operations they perform, which are novel, which are ordinary. That



makes little difference. The imposing fact is that they can be built to do almost any task there is, and once built, may be assembled in any strength you like.

They laid enough concrete here to make a road 90 miles long. They strung 500 miles of telephone wire. They use as much water as the city of Troy, N. Y. And echo answers: "So what?" The really significant point is, there was no limit to the number of units they could have put

together here, there is nothing to prevent assembling twice this many machines, and there is nothing to prevent building a hundred factories like this, and there is nothing those factories—like this trim, efficient machine for producing airplane motors—can't make.

How we are to avoid an era of plenty, with tools like this, is hard to see. It'll take some doing. It'll take real stupidity, it will take obstructionism of a truly superior grade.

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### Only One Step Farther

'It may be doubted if men and women ever made such an unholy mess of things as we did from 1919 to 1939.

We have so developed our mechanical techniques that there is no predictable limit to the number and variety of things we can do. Five centuries ago, even a hundred years ago, the possibilities presented by the ingredients of this planet—iron, wood, vegetables, carbon, oil, the motion of water—were severely restricted by the poverty of the methods that had been developed to make use of them. Today, these possibilities are literally boundless.

As inventors, as engineers, as scientists, as artists of ingenuity, and even genius in the performance of miracles with a particle of dust or a drop of liquid, we are magnificent creatures; as politicians we are more apt to act like a pack of nitwits.

If we win this war and organize . . . for peace, certainly we will not thereby pop ourselves into paradise on

earth, but we will have made entirely practical a fulfillment of human desire which could never have been anything more than a far-off dream.

In this . . . there are formidable obstacles. The petty men, the greedy men, the blind men, will be the enemies of progress as they have always been; but to defeat them, and to make for ourselves and our children a . . . world in which to live and work and play, we do not need to be demigods or supermen. We need first, the will, and second, *about one-fifth of the intelligence in dealing with our fellow men that we display in dealing with coal and steel and casein.*'—Excerpts from an article by Rex Stout, author and head of War Writers' Board, in *Steel Horizons* magazine, as reported in Nov. 1, 1943 *Steel*.

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More than 54,000 communities in the United States are not served by railroads.—*Automotive Industry Outlook*.

# United We Stand For Export Only

Reprinted from a Technocracy Broadcast Over KPAS, Los Angeles

by N. Jerome Bowen 11834-3

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**'Money is the Nothing you get for Something, before you can get Anything' — Frederick Soddy. Yes, but why let it interfere with America's war effort?**

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**W**HILE the armies, navies, and air forces of America engage our fascist enemies in many far-off corners of the world, a many sided battle is being waged here at home against another common enemy. It will last and we, the people of these United States, will continue to lose until we realize that we can only win by establishing scientific, all-embracing controls over all phases of our war economy.

If you think that the threat we speak of is not real and that the battle is not hot, if you do *not* think that we are so far *losing* it, check up on what you pay now for *clothes*, as compared with what you paid two years ago; check on the level of the *food* in your market basket that your dollar buys as compared with what it did two years ago or even six months ago. In the same way compare the cost of anything you buy and finally check up on the total cost of all you buy in relation to your income. For we are speaking of the national struggle against the rising

cost of living, a struggle that seems more hopeless every month because we fight it with such flimsy, inadequate weapons and which we could end overnight by the only means that will ever end it in our favor; that is, by removing, at least temporarily, our present methods of production and distribution which give weight and power to the growing inflationary trend.

Although its beginning was the result of the overseas fireworks, this battle at home began before *our* part of the shooting abroad started. More than a year ago wages and prices had gone so far in their see-saw ascent that the President announced his plans for a major counterattack to be initiated simultaneously on seven fronts. The first four contingents were directed at prices. Price ceilings were to be established on nearly everything from shoe strings to 10-ton tractors. Rationing of most primary foods, later of some articles of clothing, was to be made effective. Wages were to be stabilized, and farm prices adjusted. The *other* three measures were aimed to make *loose money tight*, to hold it in one place so it would not bid up the prices of the shrinking supplies of consumers' goods. To do this the campaign was planned to control consumers' credit, that is, to discourage installment



buying and encourage the paying off of debts; also to pile up national tax levies and push down the profits for all hands.

The barrage was opened by Leon Henderson's General Price Order of 1942, freezing most prices across these United States. The War Labor Board acted on wage stabilization. OPA spread what they intended to be permanent, immovable price ceilings far and wide on many farm products. Then rationing was installed and extended. Here was a program that to its proponents seemed to insure results. To them it seemed infallible and sure-fire. But the forces of inflation instead of receding have advanced and are still advancing. Many of the price ceilings have already sheared their bolts and headed for the stratosphere. Various labor groups have been fighting for and have received wage increases to match the rising cost of living, and from this cause alone more ceilings have grown wings.

The reasons for the failure of this seven front attack on one of America's major home front enemies are many. Here are a few of them. The OPA has been trying to keep the bolts tight on its many price ceilings with less than 4000 field operatives. There are 1,770,335 distribution outlets in these United States. There is now only one OPA inspector for every 443 of these establishments. Plainly his calls on any one of them will be rather infrequent. Not long ago our OPA put out its pitiful plea that it had no hope of controlling prices without the voluntary coopera-

tion of the American people. Technocracy points out that we never have accomplished and never will accomplish price control by the voluntary assistance of the American people. Voluntary methods are no more successful in fighting the difficulties at home than they would have been if applied to the mobilization of our Armed Forces to fight abroad.

One reason for the non-support of price regulations by the general public is this: As long as we persist in clinging to the peace time practices of business operations, profit taking is the major incentive for increasing production. Where profits in any industry are limited by a price ceiling, that particular industry will not greatly exert itself to increase its production.

### *No Representation Without Pressure Groups.*

Furthermore price ceilings are threatened and attacked by the highly organized farm bloc. The farm population is about 22 percent of the total in these United States. Although they furnish us nearly all of our food and also enormous quantities to be shipped abroad to our Armed Forces and to our Allies, they collect approximately only 10 percent of the national income. Naturally they fight stabilization of farm product prices. On the other hand, every gain the farmers make in their battle is the signal for organized labor to launch a fresh attack on the wage stabilization legislation. When the cost of living rises with the rise in the prices of food,

labor demands increased wages to match it.

The check on installment buying is opposed by the merchants whose mouths water at the sight of so much money for down payments on automobiles, radios, pianos, washing machines and similar high priced commodities, burning the pockets of those who are getting the high wages of the aircraft and other war time industries.

The government's plea that everyone should save more and buy less strikes no answering chord in the breast of the average war industry worker. Many of them never before had incomes sufficient for more than the bare necessities of life. Now that they at last have sufficient for a few of the luxuries they do not relish being barred from buying them.

Brokers and money lenders look askance at or openly oppose the policy of paying off debts. They make their living by the loaning of money. Their occupations would be gone if all debts were paid. Each of these groups fights its own private battle. Each wants a victory for its side, disregarding America's major national objective of winning this war as soon as possible and with the least loss of national wealth and American lives. The sum of these groups is the home front civilian population of America today.

Coming to the subject of more and heavier taxes as a check on inflation we find the toughest, hottest situation of all—Death and Taxes are two threats that everybody fights, but while death cannot be fought off in-

definitely by anyone, the question of *who shall pay how much taxes* has been a much-gnawed bone of contention as long as *money* has functioned in any social order. So today everyone continues *this* fight and Congress is *still* kicking around the various proposals to raise the extra billions and *no one plan* to raise this sum has yet been finally approved.

Now just lately the coal crisis and the miners' strike and their demands for higher wages to match higher food prices has stimulated the administration to a *final* effort to counteract the rising tide of inflation. The administration is now rolling back food retail prices on some commodities, subsidizing the farmer and in some cases the food processors, thereby releasing the most magnificent display of verbal fireworks that our congressional halls have seen for some time. It seems probable that even if these measures were loaded with any effective ammunition whatever, no complete agreement will be reached on them for months.

### *He Who Steals My Purse Steal Trash—*

We have brought down to date a brief review of our national struggle to hold down prices and wages to keep the cost of living down. You will recall that we prefaced that resumé by stating that we cannot win in the battle against inflation until we establish all-embracing scientific controls over all phases of our war economy. The first step must be the removal for



the duration of all those financial controls now operating in production and distribution.

If you have a large tree near your home which shuts out light and air and which may in a heavy storm blow down and wreck your home, you do not waste time and effort lopping off branches here and there. You take it out by the roots. And the difficulties we encounter in attempting to combat this rapidly growing inflationary trend *have their roots* in the business and financial structure within which we operate our national economy.

Technocracy's program of Total Conscription, to be effective for the duration and for six months thereafter, proposes freezing the entire financial structure of the nation for the duration and thus eliminating for the same period all the operations of private and corporate business. Government would take title to all farms and other products at their sources and distribute all products as needed. Food, clothing and all necessities of life would be rationed but not priced. The only money in circulation would be that disbursed by the government in salaries and wages and all civilians would be rated by the same scale of pay as the members of the Armed Forces are. Technocracy calls the program 'Total Conscription,' since by its terms all machines, materiel, men and money of the nation would be conscripted into the service of the Nation.

'For such is the paradoxical character of our economy that when the Germans and Japanese cease to try to

By these terms our own government, instead of the present myriad private and corporate enterprises, would control the flow lines of all goods and services. This is the only method by which the cost of living can ever be controlled and held in check. You cannot have fire without heat, rain without clouds, nor inflation when and where there is no money, nor credit, nor prices, *nor financial structure to inflate*. With Total Conscription in operation pressure groups could press no more for higher wages and lower prices. No one of them would any longer have anything with which or on which *to press*.

Maximum efficiency in our domestic war economy is mandatory for final victory. Cash and credit, money, checks, debt and the devices of buying, selling and profit taking *are not* our offensive weapons. *Their* use only clogs the gears in our factories, hinders free distribution of the necessities of life, and withholds the full employment of our maximum strength for war. *But the blood and Iron, the Men and Materials of America*, the resources and productive ability, freed from Price System bonds and united under the specifications of Total Conscription *can* defeat the high cost of living and wipe out fascism at home and abroad *forever*.

Technocracy asks again, WHAT ARE WE WAITING FOR?

kill us it will be harder for most of us to keep alive than it is at present.' *Fortune* December 1943.

# *From The Camera's Eyevue —*

## **The Real Story of America**

*From Material Furnished by Education Division, 8342-1*

### **'When My Ship Comes In'**

**T**HE average American pursuing his average way from one year's end to another has little conception of the world of reality around him. Like a fish in the ocean, he is immersed in the artificial ideologies of the social structure of which he is a part. He plods along his well-worn rut, working, eating, sleeping, mating and chasing after phony recreation. A host of little worries, problems and obligations are snapping at his heels every day. His nose is on somebody else's grindstone all the time.

Occasionally he seeks surcease from his sham existence in the corner tavern where any man may become a big shot to himself for a time, and for a price. Or else he may indulge in the vicarious heroisms of Hollywood art, at the movies, or the 99-44/100 percent pure drivel of radio dramas where, in both cases, 'right' always defeats 'wrong' and virtue is triumphant in the end. This is supposed to constitute recreation and escape from reality. He has been told that it is good for him.

Somehow or other, though, he never finds complete satisfaction in his counterfeit existence. Ever present in the average American is a psychological longing that finds expression in the words of a popular song: 'Somewhere over the rainbow, way up high, there's a land that I heard of, once in a lullaby.' This yearning visualizes a far-off land of happiness, where all wrongs will be righted, all dreams will come true and his very own ship will come in, at long last.

### **Escape Into Reality**

It is not physically possible to escape from reality, it is always present. One can only escape from one artificiality to another one with a different odor. Reality always follows and must be reckoned with in the end. That's what is dogging the average American. So he chases from one fraud to another while all around him, pressing in from all sides, are the physical realities by which it is possible for him and all other citizens to live and prosper. Indeed, these physical realities are becoming so insistent in modern America that it is becoming more and more difficult to deny them.

North America has progressed into an order of magnitude and complexity of operations in her civilization wherein the dominating forces behind the superficial social, political and economic facade are the laws of thermodynamics and the impact of technology. It is only by physical facts that we can live and prosper in the Power Age and these facts require very little discussion because they can be determined by measurement. Being dominated by physical laws this culture of the Power Age must also be directed by physical laws.

The superficial, tantalizing existence of the average American today is traceable to the futility of endeavoring to fit all social problems into the Procrustean bed of an obsolete political ideology. The facts which determine our existence cannot be determined by counting noses to get a consensus, when decimal points are necessary. We have outgrown the old standards. We are trying vainly to escape into the past which no longer exists; while the future is rushing at us with potentialities which beggar description.

In order to understand the realities of living in the Power Age, it is necessary to know the physical history of America, the story of the impact of science and technology upon the social structure and the resulting instability produced thereby, together with the irreversible trend of physical events following that impact. It is not enough to know the technical aspects of science; millions are familiar with that now. One must also grasp the social aspects of science.

This fact is understood by only a relatively few Americans today and there is only one Organization set up to propagate knowledge of this type. That Organization is **TECHNOCRACY INC.** It is dedicated to a more efficient design of social and industrial operations. For our picture story this time let's escape into reality and pay a visit to the **DETROIT SECTION OF TECHNOCRACY INC. AT 9108 WOODWARD AVE.** There, on the walls, for all who care to see, is the Real Story of America in the form of maps, charts and mural paintings.



SEC. I  
8342

# TECHNOCRACY

IN



ALL TECHPHOTOS BY 8342-1

A morning view of Technocracy Hall, with two large show windows. The one to the reader's left has a large disk set up in front of a deep blue background, giving the illusion of a globe. The North American Continent faces toward the onlooker. The other window is used for literature displays, etc. Inside are offices, a meeting hall and work and recreation rooms. It's the center for all educational and social activities of the Technocrats of Detroit. It's open every day from 10 A.M. till WHEN? A.M.



Inspecting the maps comes first in our tour. Guide gives data on population, resources and available energy of various areas. The possession of ample energy and resources in any area dictates the necessity of technological coordination for a very high standard of living because it invalidates the human-tail, hand-tool scarcity methods natural to low energy and resource areas. America is the greatest technological potential in the world. Russia comes next. America's problem is one of abundance.



ILLUSTRATION OF ANIMALS AND PLANTS AS WEAPONS

MORE FOOD AND GREATER POPULATION



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2. WEAPONS  
3. FOOD SUPPLY  
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FIRE  
DEFENSIVE AND  
OFFENSIVE WEAPONS  
More food — less mortality

## THE POSTULATES OF SCIENCE

A POSTULATE PARTAKES OF THE NATURE OF A FACT BUT DIFFERS FROM A FACT IN THAT THE OBSERVATIONS SUPPORTING IT ARE NOT CONFIRMABLE

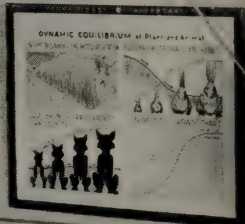
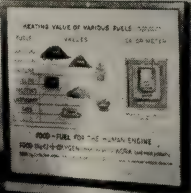
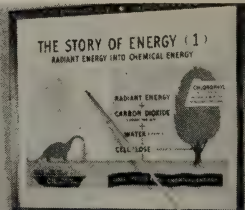
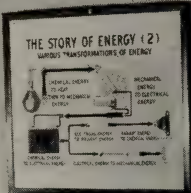
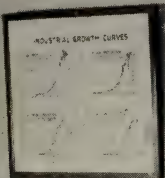
- 1st POSTULATE  
THE EXTERIOR WORLD ACTUALLY IS
- 2nd POSTULATE  
NATURE IS UNIFORM
- 3rd POSTULATE  
THERE ARE SYMBOLS IN THE MIND WHICH STAND FOR EVENTS AND THINGS IN THE EXTERIOR WORLD

## INTRODUCTION TO SCIENCE

SCIENCE  
THE METHOD OF THE DETERMINATION OF THE MOST PROBABLE

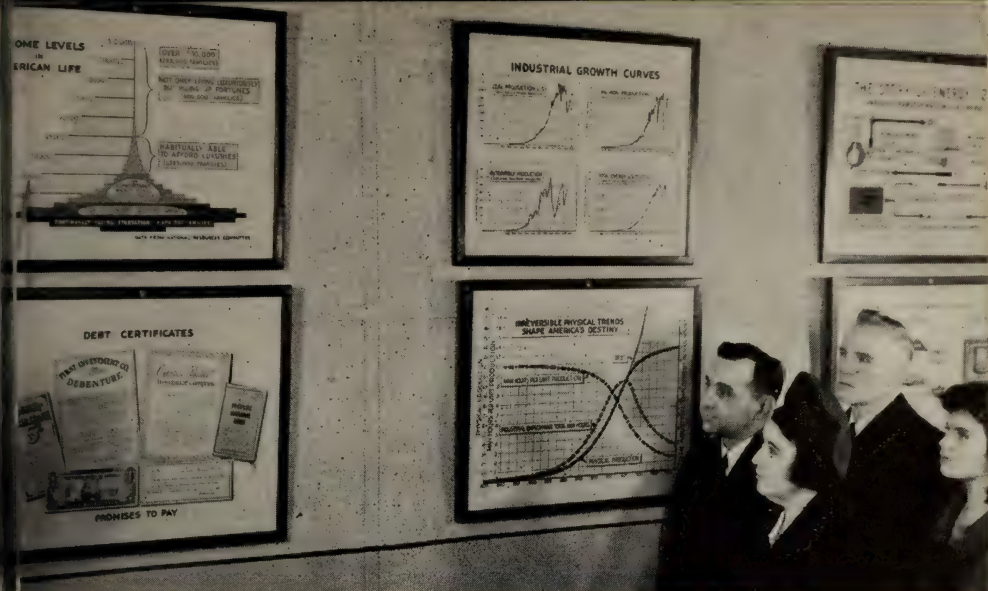
- A FACT  
A CLOSE AGREEMENT OF A SERIES OF OBSERVATIONS OF THE SAME PHENOMENON - All observations must be susceptible of confirmation
- A DEFINITION  
AN AGREEMENT - wholly arbitrary in character - AMONG MEN

Science shows the correct way to approach the social problem. First comes the three basic postulates of science, then the nature of Fact and Definition and the scientific method. This is elementary and indispensable. Man's progression from the savage state can be measured by his rate of energy conversion. Naked and unarmed, he was prey for wild animals. With fire and club he could hold his ground. With domestic animals, windmills and bow and arrow he became more secure and dominating.

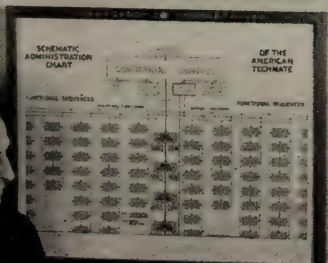
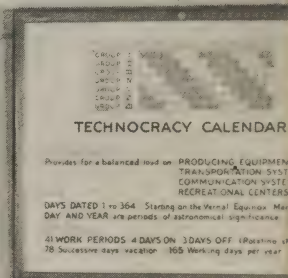
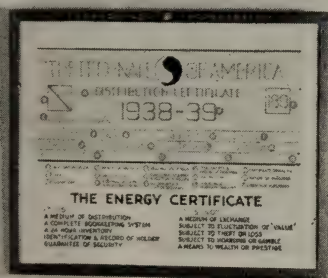


There is a perpetual struggle going on between all plant and animal life for a larger share of the Sun's energy. This creates a state of natural balance, i.e., dynamic equilibrium. Any species that captures more energy disturbs this balance in its favor. All plant and animal life pursues a fundamental 'S' shaped growth curve. Energy is basic to all life; it can be changed into many forms for use and it can be measured. The law of energy determinants is immutable.

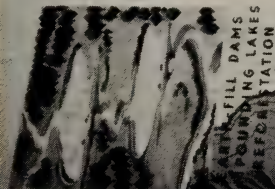




Industrial growth curves follow the same 'S' shape as growth curves in the plant and animal world, starting slowly, accelerating to a compound interest rate and levelling off. Then they may remain constant, decline to a lower level or to zero. The interference control over higher industrial growth is the mechanism of the Price System. Goods cannot be produced except by creating ever more debt. This is already past history in America. Notice the chart of Income Levels in American life.

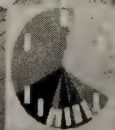


Illustrated here are the Energy Certificate, a non-debt creating medium of distribution; the Technocracy Calendar, necessary to attain a balanced load system of production; and the Schematic Administrative Chart for technological control. All this is a scientific design to tip the factors of dynamic equilibrium in favor. America must either go up or down. The design involves voluntary acceptance of scientific controls, because social change must be accomplished peacefully.



ARTIFICIAL DAMS  
POUNDING LAKES  
RECREATION

RICE SYSTEM  
ACTS LEADS  
TO  
LITTER AND  
GUTTER



SCIENTIFIC OVER-ALL PLANNING



FLOOD AND EROSION CONTROL



Overall view of mural paintings on north wall of the meeting room. They were designed and painted by Technocrats. For comparison with better known murals in Detroit, see *January-February Great Lakes Technocrat*, page 43. The North American Continent shown comprises 19 percent of the world's land area. It has the full range of climatic conditions and the lion's share of the world's natural resources.

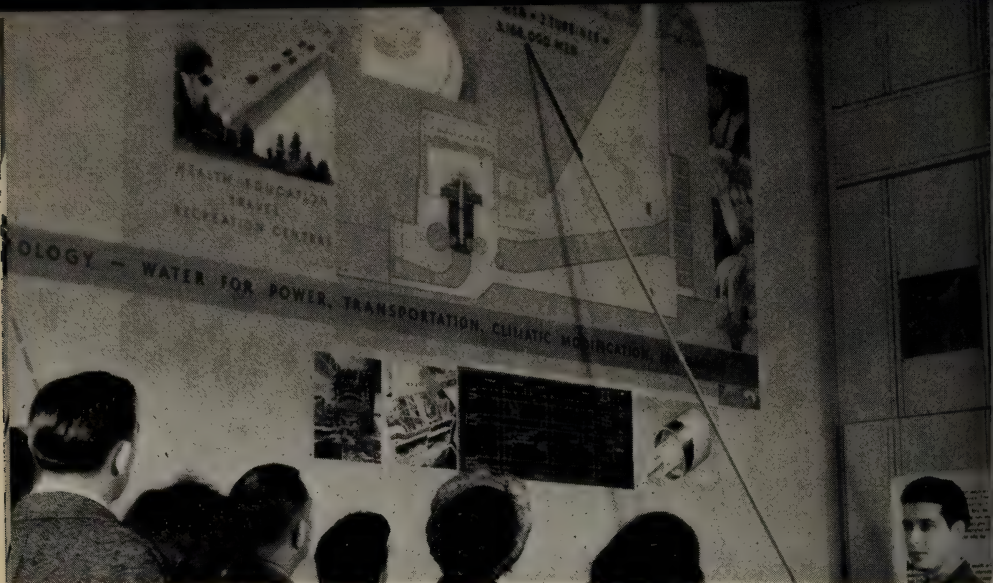
Racially, it is the most homogeneous area on earth; geographically the most united; industrially the most advanced. It has over 2/3rds of the world's engineers and the largest body of skilled personnel, yet contains only 9 percent of the World's population. North America is one organic and functional unit. Abundance is possible on this Continent now.





Technocracy proposes the application of Science to this Continental Area. Since America is the richest loot in all history, it is necessary to consolidate this area; vastly expand our technology; build the world's most powerful Armed Force; construct Continental superhighways; dig Continental inland waterways; install a Continental power transmission system; and provide gigantic defense bases around its perimeter. From

the International Date Line on the West to a boundary line in the East reaching from the tip of French Guiana to Greenland is the minimum area for the maximum defense of America. Who shall say that this great motherland of the Power Age needs less defense? This proposal is the greatest project ever conceived by the mind of man.



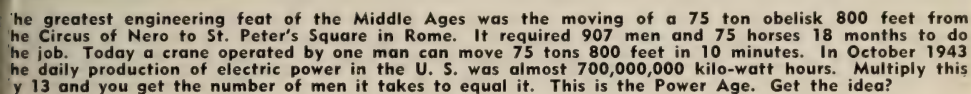
Two turbines added to the skill of 38 men equals the labor power of 3,168,000 men. Doesn't make sense? Yes it does. The social implication involved is food on the average man's table, shelter for him and his family against the elements and security for his old age. He had better learn its meaning. Below is a blueprint of the Continental power system. To its right is a cross-sectional view of the underground cable for transmitting 1,000,000 volts D.C., 3,000 miles, with only 10 percent line loss.



Billions of years of sedimentation deposited on America's surface 9 inches of fertile top soil. Every year 1,000,000,000 tons of it is washed into the oceans. Out of 1,903,576,620 acres, 41.5 percent are seriously eroded, 14.8 percent severely so, 7.6 percent useless and only 36.1 percent unaffected. One-third of America's resources have been literally sold down its rivers. Price System methods lead to erosion and ruin. Reforestation and thousands of dams are necessary to halt this waste.



-20  
-17



ne man could produce one ton of coal in twelve hours 100 years ago. Today in a modern strip mine one can produce 25 tons of coal in 8 hours. Notice the 'S' shaped curves on this basic chart by *Technocracy Inc.* Notice how total man-hours and man-hours per unit are declining toward zero while production has risen to a high peak. The only way to produce more is to work less. These curves obey the physical laws of dynamic equilibrium. They hold the answer to America's problems.

# TECHNOCRACY INC.



## TECHNOCRACY IS AN OPEN BOOK

As night settles over America's greatest industrial city, the fluorescent lights blaze out bravely at TECHNOCRACY Headquarters. Until the early morning hours Technocrats work and plan for America's defense and future destiny. The social analysis of Technocracy is irrefutable. Its synthesis of a modernized social system is buttressed by the best scientific evidence available. If Technocracy is 100 percent wrong, then the worst that can be said about it is that it never did any one any harm. But, if it is correct then God help America, for no other power will be able to, if her citizens do not adopt scientific methods of control.

SINCE JULY 1940, 18 MONTHS BEFORE THE JAPS BOMBED PEARL HARBOR, THE SOCIAL PROGRAM OF TECHNOCRACY HAS BEEN PUT ON THE SHELF. No nation can achieve social change internally unless it is first free from outside aggression and inside treason. Technocracy warned against the rise of World Fascism as early as 1935, and spoke up repeatedly in the years that followed.

In August 1938, Technocracy presented specifications for the Army, Navy, and Airforce to repel any attempted attack from Atlantic or Pacific, and charged that the military budget of the United States was inadequate. In September 1939, Technocracy demanded the development of a Continental strategy and the planned generalship of all Continental operations for the security of America. In home defense activities, Technocracy has participated to the full. Our Section Headquarters have been used for Selective Service registrations, for first aid classes, and air raid warden work. Technocracy's mobile sound units are used by police and fire departments. On December 7, 1941, Howard Scott, Director-in-Chief of Technocracy, sent a telegram to President Roosevelt in the name of the Organization placing the entire personnel and equipment of Technocracy Inc. at the disposal of the Commander-in-Chief and pledging the unqualified support of Technocracy to the Administration's war effort.

SINCE 18 MONTHS BEFORE THIS WAR TECHNOCRACY HAS BEEN ADVOCATING TOTAL CONSCRIPTION. The trend of events is moving irresistibly toward the perilous post-war period ahead. Total Conscription will be even more necessary then than now. If we insist on winning this war at the high cost of Price System methods, we will be in great danger of losing the peace and sacrificing the greater destiny of America to pro-fascism at home unless we adopt Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None. Total Conscription is the key to America's future. How about it, Mr. and Mrs. America? INVESTIGATE TECHNOCRACY.



# Lives, Fortunes, Sacred Honor--or Profits?

by Thomas H. Gibbins

## *Patriotism Consists of Deeds*

**W**E pledge our lives, our fortunes, our sacred honor.' These words, written into the Declaration of Independence by our forefathers, show to what length they were prepared to sacrifice to set up their own mode of social control, a mode of control that would be acceptable to a majority of the people living under its jurisdiction. They fought a long and bitter war to win that right, they sacrificed lives, fortunes and upheld their sacred honor to win that war, **AND THEY WON.**

We, too, are today fighting a major war spread to the far corners of the earth, though for different reasons and principles, a war against the world-wide conspiracy of fascist control. We dare not, **WE MUST NOT LOSE**, but are 'all of us' pledging our lives, our fortunes and sacred honor? One need only scan the daily newspapers and observe the actions of the people in everyday life to get the answer to that question.

Let's have a look at some of the facts of the situation and analyze them and see just who are or are not willing to pledge their lives, fortunes and sacred honor. First we have the pledge; and if need be the sacrifice of human life. The men and women in the Armed Forces have surrendered their Price System privi-

leges for the duration of the war, or the duration of their lives, whichever comes first.

They cannot collect overtime pay for the long, tedious periods of drill, study and training in preparation for combat. They can't go into battle under the protection of a 'cost plus' contract. The Armed Forces of Uncle Sam do not operate according to the principles of so-called 'free enterprise.' The anarchy of privileged individualism is unknown there. So it must be said that they are pledged and will continue to pledge and if need be to sacrifice their lives. Need more be said!

## *Treason Also Consists of Deeds*

Let's look at the pledge of fortunes or wealth on the home front and what a sorry picture it is. People who are otherwise patriotic will go to almost any length to obtain more wealth and keep what they already have, regardless of the consequences it will have on their fellow citizens as a whole. The present system under which we are trying to function, being what it is, one cannot blame them, for they have been so indoctrinated with a Price System philosophy, which grew out of an age of scarcity,

that they cannot see the possibilities of the high technological age of abundance for all at which we as a nation have arrived.

What about the actions of some individuals and groups of individuals? What about labor? We find that we still have strikes, many of them, in spite of so-called non-strike laws and labor's agreement as a whole not to strike for the duration of the war. For many years the lawful right of labor to strike has been its chief weapon to use for gain. Can you blame labor for continuing to use this weapon for gain when everyone else is using every means at his disposal for gain also? It has been stated publicly that the coal miner's average wage is around \$7 to \$8 a day, long-shoremen in the San Francisco Bay area \$15 to \$17 per 10 hour shift, shipyard workers \$60 to \$90 per week for an 8 hour day and 6 day week. There are, however, millions in many lines of work who are still making only \$20 and \$30 a week.

There is such a wide differentiation in wages that there is little wonder that confusion, ill-feelings, strikes and continual changing from one job to another exists. At one of the major ports of the Pacific Coast, the turnover of personnel in many types of work ranges from 25 percent to nearly 100 percent per year, and this even now in spite of the so-called 'job freeze.'

For some time there has been a great hue and cry about the shortage of labor; while businesses, both large and small, have been and still are crying to high heaven that they are be-

ing forced out of business, many more will find it impossible to continue. Large firms will gradually be forced by the march of events to accept more and more government control, many of them will blame government, not realizing that by the same token of the march of events, government is forced to take action in order to conduct and win this Total War.

Through the exigencies of war, the government has become the chief paymaster, but business as a whole still likes to think it is operating on a free, competitive basis. Is it? Most of the business firms who are producing the actual tools of war are getting their 'cost plus' and are all selling to the same buyer, government. Is that competitive, 'free enterprise'? For the time being, they are on a 'gravy train'; others are on it indirectly.

Right now 'free enterprise' is conducting, planning and organizing dozens of post-war agencies to try and keep what is left of it off of the rocks when hostilities cease. Millions of dollars are spent, much time is being wasted, effort and material needed in the war effort is used in advertising via radio, billboard, newspaper and magazine, trying to convince the public that they are the shining exemplars of the greatness of America.

The handwriting is on the wall, but they cannot read it. All of this is coming about in the trend of events caused by the conflict of a system that is diametrically opposed to the physical laws of a highspeed technological set-up. The war has greatly increased the need for more and more



efficient technology. It is rendering the Price System unworkable.

### *Stumblebums Use Stumblebum Methods*

We are fighting a Total War. We are fighting for America, and for what America can be. If we really want to put our whole effort into it, if we want to really pledge our lives, our fortunes, our sacred honor, then why, solely for the sake of business, do we permit so much wasted time, effort and materiel? Why do we still have two, three, four dairy companies delivering dairy products in the same block, three to six bakery trucks delivering bakery products to the same stores, many others in the business of serving the people duplicating each other's efforts in the same block or area? There are still many business firms producing and distributing non-essentials that could be discontinued for the duration. Thousands of people living in Area A Travel to work to Area B, while thousands doing the same type of work travel from Area B to Area A. Not only is this taxing our transportation facilities to the breaking point, but we are using vital resources, such as rubber, metal, oil and labor, at a rapid and needless rate. Then there are thousands of older people, the incapacitated, the retired, the loafers and gamblers occupying much needed housing in crowded defense areas while workers are forced to travel many miles to and from work.

These are only a few cases of the

needless confusion, the waste of time, effort and materiel. There are many more, and it is all a result of Price System operations. 'Free enterprise' would lead us to believe that this is what we are fighting for. Their philosophy seems to be that if 'free enterprise' cannot be saved and maintained, then nothing else is worth saving or maintaining.

Many cannot conceive of any social system being acceptable or desirable without a 'free enterprise' Price System concept. With its demise, they envision stark horror and the whole nation engulfed in some sort of slavery. Nothing could be further from the fact. Modern technology, modern production and distribution of goods, if allowed to be conducted along scientific and engineering lines, plus our abundant natural resources, can and will win this war and create an abundant high standard of living for every man, woman and child on this Continent, regardless of what business thinks.

### *Public Honor Is Security*

We now come to the question of honor, sacred or otherwise. We have been reading daily in the newspapers of black markets. Remember, it takes two to effect a transaction or sale of goods from one to another. There must be a lot of us on the receiving end of the goods, else the black markets could not exist. Then there is the little matter of many of our free private enterprisers indulging in the production of shoddy and inferior war materiel, as well as goods for home

use, and being hailed into court by our government. The question of crime was in peacetime the major and most costly problem of our government; wartime conditions are increasing crime and the cost of combating it. Penal authorities tell us that more than 95 percent of all crime has behind it the motive of individual personal gain. There are, of course, a good many other types of chiseling and conniving, indulged in for personal pleasure and gain.

When one hears, reads and observes all of this, it becomes evident that many millions of us are not pledging either our lives, our fortunes, nor our sacred honor. The reason we behave in this way is not because we are individually evil or nationally evil, but simply because the system being what it is, that mode of behavior is most natural.

The members of Technocracy Inc. are proud to belong to an organization which for more than a year and a half before Pearl Harbor advocated and put before the people of America the program of Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None. The installation of this Victory Program would literally place us all in a position of living up to the pledge of life, fortunes and sacred honor, so that we may win this total war and the peace to follow in the shortest possible time and with the least loss of life. Many millions of people would find that they were in the best position that they have ever been in. It would injure no one; it

would make impossible the continuation of the deplorable conditions now existing.

Space here does not permit of a full and complete coverage of all that Total Conscription will accomplish. Visit your nearest Technocracy Section, listed in this magazine, the *Technocrat*, or the *Northwest Technocrat*. You will be supplied with literature and information on the one complete overall pattern of national operations.

Technocracy does not claim that its program is perfect, but it does claim that it is the most workable plan for solving the problem at hand yet advanced by any person or group of persons, and it has the facts to back up that claim. We challenge our critics and opponents to present a more workable plan. We will be with them 100 percent if they can.

This is a challenge to you. As an American, will you accept the challenge? If in so doing, you find that Technocracy is correct in its analysis and solution, we know that as an honest-to-goodness American you will recognize that we are the outstanding American organization advocating an American factual solution to an American factual problem.

The boys on the battle fronts are giving their all, for you and for me, and for what America will be when they come back. Are YOU giving or doing as much? Have YOU the gall to want to do less? If you would call yourself an American, YOU should have the guts to be out shouting to the housetops Technocracy's Victory Program of Total Conscription.



# How Funny Are The 'Funnies'?

by Walter Allen

*'Read Me The Funnies, Daddy'*

IT IS reported that none of the newspapers in Russia carry comic strips or cartoons so familiar in American papers. The comic strip is of American origin but today has spread to most countries of the world. It is not likely that the present Government of Russia is responsible for the lack of comic strips in the newspapers there. It is more probable that it is due to lack of a demand on the part of the Russian people. They have developed other types of escape mechanisms.

Today in this country every daily paper large or small as well as many weekly papers carry one or more of these comic strips. There are a total of 270 of these features being published at the present time. The standards of many are very low and are just able to 'get by'. Some of the gangster-detective type are sadistic, others are fantastic. They are the products of the hectic times in which we live.

The original object of the comic strip was to provide humor for the reader, hence the name. Few today, however, depend on humor for their plot. Good and bad they supply an escape mechanism for millions of followers. Among these followers are some of our most gifted scientists as well as many in all walks of life.

We have the comic strip with us

today. Are they used as a conditioning factor in the Price System? The answer is for the most part, yes. They are an ingenious method of conditioning the American people along certain lines. The producers of our comic strips follow popular trends. At one time the gangster was the hero of many comics. Today it is the detective and now we have the glamorous, junior G Man. When the present war was apparently a long way off there was no military atmosphere to any of them. Now most of these productions carry war themes.

When a war bond drive is on, the characters will talk up bond sales. Recently an Oregon union protested that 'Little Orphan Annie' was anti-union. We have seen none that are pro-union. The newspapers are their main outlet and because the 'free press' of America is controlled by those who pay for the advertising these features must be kept in line. They are definitely a conditioning factor in the Price System.

## *Big Business is Not Funny*

According to an article in *Newsweek* for December 27, 1943 Nelson Rockefeller's Office Of Inter-American Affairs spent \$50,000 creating Spanish and Portuguese versions of 'Heroes Verdaderos,' illustrating American war exploits and 'Nuestro Futuro' an anti-nazi comic. The Inter-American Office referred to this as

'serious literature using the comic strip technique.' It has since abandoned the venture.

In the U.S. the comic book business now rollicks 'along at 25,000,000 copies monthly' and retail sales add up to \$30,000,000 annually. 'An overseas edition of 35,000 copies of "Superman" goes to the troops each month.' Children, however, 'remain the best customers.' It is estimated that 95 percent of the 8 to 11 year old group read the 'funnies'; 84 percent of the 12 to 17 year group; and 35 percent of the 18 to 30 year group. The publishers say that after 30 the urge for comics slackens off. These publishers have now 'bolstered their

editorial boards' with clergymen and educators whose job it is to 'lull the fears of parents.' *'Six thousand schools now use the comics as supplementary texts.'*—italics ours.

As has been stated the authors and producers of comics have always followed the trend of events, after it is well under way. The trend of physical events in America is moving toward Total Conscription of Men, Machines, Materiel and Money With National Service From All and Profits To None. It will be interesting to see how the \$30,000,000 comic strip industry will follow this trend after it is well under way. Or will they? Don't be funny. Bilge gathers only in still water.

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### Which Side Are You On?

Three prominent and wealthy business men, one a New Yorker, sat down to lunch in one of our swank Boul Mich clubs the other day. After lunch they decided to have a few cocktails. By the time they were ready to depart their tab was \$36.00. 'Here let me have that check,' exclaimed one of the Chicagoans. 'My income's in such a high bracket now that this \$36.00 check will only cost me \$3.60.' 'Oh, no!' cut in the New Yorker. 'I'm paying this one. I'm entertaining you people on business and I've got a cost-plus contract with the government—so I'll make \$3.60 on the deal.'—Kup's Column, *Chicago Daily Times* December 19, 1943.

'According to one high-priced advertising writer, all the American soldier thinks about as he goes into

battle is the necessity of keeping America absolutely unchanged after the war. This sounds to me much more like the thoughts of a high powered advertising executive as he sits down to fill out his income tax blank . . . If it (pre-war America) had been good enough, we wouldn't be out here now. We would have stopped Hitler & Company at the first rehearsal instead of waiting until they took their act on the road . . . If it had been good enough, we would be home now making sons and automobiles instead of assaults on fortified positions.'—Pvt. Irwin Shaw in *Yankee*, December 17, 1943 in a piece on policing and de-polluting Germany after the war. From a weekly letter to service men and women by W. J. O'Brien in *PM's Picture News*.



# Lo! The Poor Dumb Indian

by R. B. Langan

Reprinted in part from the Department of the Interior Information Service, Office of Indian Affairs. (Italics ours)

## *400,000 Indian Givers*

THE 'vanishing' American Indian is turning out to be 'one of the most potent minority groups assisting in the Nation's march to victory.' Since Dec. 7, 1941, 18,000 descendants of the original inhabitants of this Continent have joined the Armed Forces of the United States. In some tribes the number of able bodied men who have gone to war runs as high as 70 percent.

Indian women, girls and older men 'have produced more food in the last two years than they ever did before. Indians have raised and sold enough beef, mutton, poultry and fish to feed 220,250 soldiers for one year; enough cereals to feed 367,103; enough potatoes and vegetables for 52,057; and enough wool to supply clothing for 19,000 soldiers for one year.

In recent weeks, top-flight generals in every theater of war have vouched for the prowess of the American Indian in the ranks of the armed services. In a cablegram from Australia recently, General MacArthur said of the American Indian soldier:

"As a warrior his fame is worldwide. Many successful methods of modern warfare are

based on what he evolved many centuries ago. Individually he is exemplifying what the line fighter can do by adaptation of the characteristics of the particular countryside in which he fights. His tactics, so brilliantly utilized by our first great commander, George Washington, again apply in basic principle to the vast jungle-covered reaches of the present war."

In the various services, hundreds of officers are full-blooded Indians. You will find them commanding ships at sea, in the Rangers and the ranks of the paratroopers, piloting fighter planes and bombers, in charge of PT boats and as general officers.

American Indians today are fighting on every front of this war. And Hitler and the Germans know their metal. They discovered the American Indian back in 1918. In that year, just before the Boche surrendered, General Karl Von Prutch said:

"The most dangerous of the American soldier is the Indian. He is brave above all else. He knows far more about camouflage, inherited from his ancestors, than any modern soldier that has the benefit of science and great laboratories. He is a

dead shot. He needs no orders when he advances. He is an army within himself. He is the one American soldier Germany must fear."

In this war, it has been generally conceded, that physically most Indians have the qualifications for a brave fighter. Their long sleek muscles are built for endurance. The sense of perception of most Indians is so acute that they can spot a snake by sound or smell even before they can see it. Too, they have an uncanny faculty of weaseling over any kind of terrain at night, and are wellnigh indefatigable. The Indian also has better muscular coordination than any other race. They love the bayonet, which probably explains why they are the best bayonet fighters in the world.

There are countless stories coming back in regard to the valor of Indians on the battlefield and numerous honors and citations have been given. It would be invidious to pick and choose but among those cited have been Assiniboin, Cherokees, Chickasaws, Choctaws, Crows, Iroquois, Kiowas, Navajos, Pawnees, Piutes, Sioux, Zuni and many others. The North American Indian has 'laid it on the line' for America.

#### *'But Their Name Is On Your Waters'*

The American Indian has a slightly different concept of America as compared to that of the white man. This

may explain in part why they have risen so nobly to defend America. Their individual and collective racial memories are far from overflowing with gratitude toward the white man's Government. They know that the 'white faces' drove them from sea to sea; hounded them out of nearly every worthwhile piece of territory they ever occupied; broke treaty after treaty with them; and to this day treats them with shabby condescension.

No! It is not because the Indian loves the white man that he fights for America. It is because he loves America. He is fighting for it now for the same reasons that he resisted the 'white devil' with his 'long knives,' his rifles and his poisoning whiskey. The Indian is the original inhabitant of the North American Continent. His concepts grew out of the physical America that he loved so well, and are a part of it. When the first white men came to these shores and attempted to transplant the European ideologies they brought along, the Indians resisted.

European ideologies were foreign to him and to America, and still are foreign to both. The Indian's concept was that he belonged to America. The white man's concept is that America belongs to him. The white man says, 'This land is mine.' The Indian says 'I belong to this land.' There is a world of difference. To the Indian his land comes first. To the white man his property rights in the land come first.

This Indian concept made it impossible for him to understand the



sacredness of property rights. To him the land was a thing to occupy and use. When one ceased to use it, his 'right' ceased and some one else could take over. That's where he got into trouble with the white man. He was willing to sell a part of his territory for next to nothing; or to give his white 'friend' some article as a token of his esteem. But if the white man ceased to use it for a time, or if the Indian needed it again, he was likely to ask for its return. So, the term 'Indian Giver' arose.

### *We Belong to America—Not Europe*

Considering the mess that European ideologies have made of America as compared to what could have been done scientifically, especially in the last 20 odd years, perhaps the Indian's instinct was correct. The ideologies with which we are attempting to wage this total, technological war are all European. The list is long and sickening; rationing, price ceiling, priorities, taxes, black markets, business first, and unequal sacrifice on the home front are only a few.

They are foreign to and incompatible with America's technological civilization. They are inimical to and out of tune with the ideal of National Service as practiced by the Armed Forces. There is a much better way, a native American way, a scientific way, to wage total, technological warfare. That is by the Total Conscription of Men, Machines, Materiel and Money, with National Service from All (equality of sacrifice, 'I belong to this land,') and profits (sacredness of property rights) to None.

In 1939 Yale University and the University of Toronto held a seminar conference on Indian problems of today. A discordant note was struck by Indian members of the conference in these words.

'That you, our white brothers, will be invited to participate in any conference that we Indians may call in the future for the purpose of finding solutions to the white man's dilemma in a social and economic order that has, during the last decade, *gone on the rocks.*'

LO! The poor dumb Indian!

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### **Another European Importation**

Neither house mice nor rats are native to America. All of the three species of rats now prevalent here have been imported, from Norway, Central Europe and North Africa. The black and Alexandrian rats from Europe and Africa, respectively, arrived with the first settlers of Jamestown. Some of them could probably claim to be descended from ancestors who came over on the Mayflower. The brown rat from Norway came over

at the time of the American revolution.

Damage caused by rats in 1943 reached the highest figure in history, possibly \$200,000,000. Rats living on farms occasion an annual loss of at least \$1.00 each; and in towns and cities the value of material destroyed by rats is probably more than \$2.00 each.

—From Fish and Wildlife Service Department of The Interior.

# The Devolution Of Statesmanship

by Ethna Hacket

## *Wishing Won't Make It So*

**W**ISHFUL thinking is the hallmark of the talk put out today by the so-called leadership of the country, financiers, businessmen, professors and politicians. Wishful thinking is its common denominator.

We must plan, they say. We must give the peoples of all the world liberty, freedom, plenty and prosperity. We must see to it, they urge, that postwar plans are made now to prevent chaos, then to bring trade relations with the world in harmony with American private enterprise. God is good, people are kind, one nation needs this, another that. We must plan for more American business.

One group of engineers, technologists and scientists began 25 years ago to work on the facts and figures of America; not as the economist would on the pathology of debt creation, money and profits, but with *what we have*, what we can produce. This group, now a Continent-wide membership organization, publishing this and other periodicals, produced, before America entered this war, an overall design of national wartime operations, with a clear picture of what we are fighting for and what we are fighting against. Technocracy began by stating that the only way to win this war and the peace is by *designing* our national operations, not by wishful thinking.

One hundred years ago, one machine—man—produced 98 percent of the physical work done in America. Only 2 percent was done by mechanical equipment using the extraneous energy of coal, oil, gas or hydro-electric power. Today, it is exactly the reverse. Over 98 percent of the physical work is done by powered equipment using extraneous energy; 2 percent of the physical work is done by man. This represents a complete change in the physical world of producing and living. It is a technological change in the life of humans, leaving nothing of the old but hangover habits. Our folkways are in direct opposition to our production methods.

When the collapse of business came in 1929, what happened? Humpty Dumpty fell off the wall, and all the king's horses and all the king's men have been trying to get Humpty Dumpty back on the wall again—all in one piece. One hundred years ago was the age of natural scarcity. Goods had value in accordance to their scarcity which was an actual scarcity owing to man's physical inability to produce an abundance. The total per capita production was low. Today, to turn out the equivalent energy of five electric power plants in New York would need 64 million men, if we used the power of men's muscles. We would then be using manpower, instead of extraneous energy. The manpower does not exist



o do this work. What is the difference between a manhour and a kilowatt-hour? Between manpower and horsepower? Our standard of living, our war effort would be impossible without these machines.

After the crash in 1929 we had 10 years of poverty, relief, WPA, and all the other letters of the alphabet combined. Why? Because there was a sudden scarcity? Because we could not produce enough? Or because the country would not awaken to the change of procedure necessary to develop and control technological advancement and to operate it scientifically for the maximum benefit of the population? Technology is taking away man's individual earning capacity, *but* is producing abundance beyond the capacity of the traditional business pattern to handle.

### *The Best Way Out Is Up*

Technocracy has talked all these years of technological procedure and control. It has been derided, ridiculed, ostracized, but has kept on and maintained that mental integrity necessary to a fact-finding approach. 'A fact is the close agreement of a series of observations of the same phenomena.' Technocracy was not formed because people wanted to get into politics, nor to start a new political party. Technocracy was formed to make people think. Howard Scott insulted them in large audiences. They went away mad, but they woke up. They tried to disprove Technocracy, but they could not. To understand Technocracy's approach it is necessary for the

average American to change his outlook, to work differently, to get a scientific background, to think objectively.

What is the cause of the present tragic mental confusion? Lack of food? Lack of manpower? Lack of machinery? Lack of trained personnel? What is the answer of the average person and what is the answer of the Technocrat to those questions?

We see a picture one day of \$10,000 worth of potatoes rotting, then sold at \$1.00 a bag. A few days later restaurants sell potatoes at 15 cents to 20 cents each. This is only an infinitesimal part of the whole problem.

The men of this nation can solve the problem on the home front. We can liquidate our pro-fascists at home and defeat our fascist enemies abroad as well. War wages, war profits and war racketeering, while our brothers, husbands and friends are spilling their blood all over the world, *can be stopped now*. When men are conscripted for the Armed Forces, they give up their right to private enterprise, to chisel, their right to bargain. They have no commercial rights, no right to make money on the side. 'Theirs not to reason why, theirs but to do or die.' The civilian population can do as much in this emergency.

Equal service from all, profits to none is the answer. The government can conscript all money, machines, materiel and all man and woman power, and place all on the same basis as the Armed Forces. Total effort, total efficiency will win a total war quicker and ensure the peace; a peace without fascist interference.

This is a blueprint for victory. It is Technocracy's blueprint, ready and waiting to be used by the U.S.A. Perhaps we will not like it, maybe it will upset some of our age-old concepts.

We will have opinions, beliefs, fears. But this is a war cry! We must rally together or go down to gradual defeat and chaos. We can use our own collective brains to do a collective job.

## HOW TO MAINTAIN SCARCITY

(In Four Easy Lessons)

According to *Bread & Butter*, the weekly release of Consumers Union for January 1, 1944. 'A tidy little time bomb is ticking away quietly in the governments Inter-departmental Committee on Leather. The time bomb is a factory method of treating leather with oil or wax to make it as much as 40 percent more durable than untreated leather. Despite the fact that shoes are so scarce they have to be rationed, manufacturers are valiantly resisting the use of this new process.'

Labor unions have a right to refuse to use labor saving devices according to a decision of Federal District Judge A. F. St. Sure of San Francisco, California. He dismissed anti-trust indictments against 78 persons, contractors and labor unions. The unions contended that painting with spray guns would cut down work for their members. The governments charge was restraint of interstate commerce. Citing the United States Supreme Court's decision of February 15, 1943 in a suit resulting from a musician's union ban on recordings the judge said that the highest court had decided unions could combine to increase employment by eliminating use of mechanical devices.—*Cleveland News* April 4, 1943.

Not so many months ago there was a shortage of hogs coming to the slaughtering markets from the farms. There was no shortage of hogs on the farms. But hogs were held back purposely by growers who wanted higher prices. There was a hog pressure bloc at work. The consumer felt it. Butcher shops couldn't supply their customers with pork.

Now so many hogs are coming to market that the packing plants can't take care of them all. The pressure bloc stood it as long as possible. It had to give in when the hogs ate the farmers' profits up. Feeding corn to hungry hogs is a costly business. So hog shipments are the heaviest ever received. Butcher shops have plenty of pork.

Many farmers are writing letters to newspapers protesting against strikes and slowdowns in war plants. The pig that was kept away from market for no other reason than that the farmer wanted more money for his work—the pig represented his work—symbolized just one form of slowing down the war economy.—*Chicago Daily Times*, January 23, 1944.

770,000,000 pounds of fresh food were wasted on the ground, unharvested, in 1942 in the state of California.—*Business Week* August 21, 1943.



# Technology Marches On

by Research Division 8741-1

## Do Machines Displace Men?

**M**ODERN Machines Save Manpower' was the somewhat frank title of *Mill & Factory* magazine's leading article in its November 1943 issue, sent to production executives in all major industries. Of course, this was not news to Technocrats, nor to engineers either. But the American public, especially those at work, still aren't sure it is true. So we'll quote, with permission of this leading Price System trade magazine, some of these cases where technology is now in use to cut down man-hours. After all, why wait until the postwar period? Isn't this the American way to do things?

All are directly quoted, and we leave you to supply the comments: (parenthesis and italics ours).

*Use of Monorail.* The installation of a light gantry crane and several monorail runways over the storage space in a yard adjoining a rail siding, permits two men to do the heavy unloading work previously done by 16 men. Result: 14 men released for other work in the plant.

*Use of Lift Truck.* The purchase of a single, modern high-lift truck . . . efficiently replaced four platform (hand-driven) trucks . . . The lift was able to stack materials directly

and quickly, requiring no additional personnel to help load and unload. Result: Four platform trucks and their operators released . . . two warehousemen who previously helped load and unload . . . were released. (Total of six men released by one man driving an automatic truck.)

*Car Puller Saves Manpower* . . . a stationary hoist mounted on railroad siding to serve as car puller permits one man to move freight cars . . . eliminated former practice of calling a crew of men. . . Result: No longer necessary to take a crew of men from other duties.

*Power Scoops.* Four men with wheelbarrows formerly unloaded box cars of bulk materials. . . The installation of a power scoop now permits one man to handle the same job in less time. Result: Three men available for other work.

*Broaching Released Men and Machines.* A special nut was being finished on old style machines at the rate of 125 per day per machine. This necessitated tying up 24 of these machines for this work in order to attain the required output. A single broaching machine set up for this type of work easily han-

dled an output of 3,000 pieces per day, thereby doing the work of 24 old machines. Result: 24 old machines and operators made available for other work.

*Machine Sweeper.* It formerly required four floor sweepers using hand brushes to clean up the floor of a plant each night. By using a machine sweeper, one man was able to sweep this area in *half the time* and do additional cleaning in an adjoining building. Result: Three men relieved for other work; one man available half his time for supplemental cleaning jobs.

*Special Press for Tire Rings.* Formerly five workers with mallets drove the locking rings under the wheel rims, when assembling rubber tired wheels for combat vehicles. With this new press, a single workman now centers the wheel, pulls a lever, and four iron claws under 21 tons pressure are lowered to snap the ring in place. Result: Four men released for other work; 2,500 man-days a year saved.

*Broaching Turbine Blades.* The use of 11 modern broaching machines for machining turbine blades permitted the elimination of 60 other machines and operators who were previously doing the same job. The new machines proved so efficient that 11 additional ones were installed to replace 60 other machines. Results: 98 men and machines released for other work.

*Overhead Duct Saves Man-*

*power.* When a new machine was installed or a machine moved to another location, it was necessary to run conduit lines and pull wires before the machine could be put in operation. This averaged about 16 man-hours—two electricians doing 8 hours work. The use of an overhead bus duct system and pre-cut and wired connecting circuits permitted one man to do the job in about one hour. Result: 15 man-hours saved on each machine installation.

*Machine Replaces 8 Lathes.* The installation of a 6-spindle automatic screw machine for use in turning out . . . quantities of coupling parts, permitted a company to turn over 8 lathes, previously used to make these parts, to another department . . . Results: Eight machines and 7 operators released for other work. The (1) operator left to run the new machine could at the same time handle work on adjoining machines.

*Centralized Lubrication.* By this system all bearings are lubricated in less than 10 minutes from one safe central point. It does not overlook isolated or inaccessible bearings, and it eliminates outage time for bearing repairs which may have been necessary by hit-or-miss methods by hand. Result: One man lubricates more bearings than ten men.

*Nine Operators Instead of Forty-One.* Nine 6-spindle auto-



matic machines with one operator each are able to produce the same output of airplane engine cylinder sleeves as 45 single spindle machines. Result: A saving of 39 operators. (Nice work, that!)

*5 Million Man-Hours Saved.* The substitution of a powder metallurgy technique for orthodox machining operations in the manufacture of a small part in . . . quantities, results in a saving of 5,000,000 man-hours per year. A few presses to be used for the new process, released an entire machine department and its operators for other work. Results: 5 million man-hours saved.

*Use of Tumbler in Metal Spraying.* It took an operator one day to spray molten aluminum on small parts arranged on wooden racks. By putting these parts in a tumbler which kept them agitated so that all surfaces were exposed to the spray of molten aluminum, the operator was able to spray 1,000 parts in 12 minutes. By this means he was able to produce the entire output of himself and three other operators in less than 1 hour. Result: Three men available for other work; one man available for 7 hours work of another kind each day.

*Welded Construction.* In the automotive field, the construction of a huge tractor-scraper unit was made possible by arc welding. In addition to cutting equipment investment almost in half,

and reducing the cost per yard of material moved by approximately 54 percent, two units of this type require 7 less men than comparable equipment of shovel, trucks and bulldozer. Result: Seven men available for other work.

We want to point out three important factors in this list, chosen at random from many more examples of producing more by working human toil less and technology more.

First, with one exception (the powder metallurgy) no *basically new* technological methods were mentioned, only examples of advantages in using machines *already developed*. Brand new techniques such as electronics, powder metals, plastics, continuous-flow, etc., would put these machines on a not-so-startling basis.

Second, in each case the company must get its investment out of the new equipment, so the machinery must be used at a higher load-factor than hand tools and methods, to justify themselves.

Third, in every instance no mention was made of gun, shell, explosive, or other purely war products these machines were used for to replace the toil and sweat of expensive, inefficient man-hours. In other words, these are plants producing essentially the same products for peacetime, civilian consumers, in that postwar America where business has made glowing promises of a helicopter in every garage and a job . . . or maybe *Mill & Factory* should not have been so frank.

TECHNOLOGY MARCHES ON!

# A Primer of Technocracy

PRELUDE TO THE POWER AGE  
BY EDUCATION DIVISION 8741-1

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In the first part of this three part acticle we outlined the fundamental role which energy plays in all life on this earth. The progression of man from savagery to the Handicraft-Agrarian stage of social life was traced briefly. From the very beginning man has been dependent upon energy. For thousands of years he lived in an environment of natural scarcity because his ability to produce was held down to the output possible with human toil and hand tools. Then came the re-discovery of America and the first practical steam engine. The stage was all set and the curtain rose on the industrial revolution.

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## *Great Events Or Great Men*

On October 12, 1492 Columbus touched land on the island of Guanahani in the West Indies. That was 451 years ago. The three small caravels driven by the energy of the wind with which he navigated the uncharted sea and the crude astrolabe employed to estimate latitude and longitude typified the simple science of that day.

It was the age of Leonardo de Vinci, Copernicus, Kepler, Galileo, Gilbert, Vesalius and Gutenberg. The first principles of modern science were just emerging from out of the long medieval night. It was an age of human toil and scarcity.

Columbus' re-discovery of America did not bring about any fundamental change in the way men lived. It added nothing to his mastery of energy conversion. Production, exchange and communication went on much as before in Europe. The same methods of living and working were

introduced in America and continued unchanged for almost 300 years more. The Kingdoms of the old world scrambled for possessions in the new. Colony after colony was established here. Generation after generation of men and women grew to maturity and decayed early in an environment of incessant toil, struggle and ever-present natural scarcity. Life was a hand to mouth existence for the great majority. On the surface and under the ground of this new country were rich deposits of natural resources. There were sleeping giants of energy in the land.

The early Americans however lacked the knowledge and methods to take advantage of this wealth. The white population increased slowly and colonization and exploration went on apace. Yet there was little change in the way men lived. America had promised much in the minds of men, but physically it yielded little except a change of taskmasters.



### *Ring Out The Old, Ring In The New*

On the fourth of July, 1776, 284 years after Columbus touched upon the outposts of America the Liberty Bell rang out at Philadelphia in the British colony of Pennsylvania, to proclaim American independence from England. This historic occasion like the achievement of Columbus promised much in the minds of men but yielded little except a change of taskmasters and a new set of abstract ideals.

However, on the eighth of March in that same year, just 103 days before America proclaimed its independence from England an event occurred that marked the highest point up to then in the progression of mankind. On that day the firm of Boulton and Watt tested the first practical,

single acting steam engine in pumping water out of a coal mine. It worked! This event introduced a fundamental change in the means whereby man lived, for it stepped up his ability to use energy many times, and signalized his major victory so far over the yoke of the past.

At the scene of the test Matthew Boulton is reported to have said to his partner James Watt: 'Mr. Watt I hope and flatter myself that we are at the eve of a fortune.' These words struck the keynote of the industrial revolution then being ushered in. Like the few preceding high points in the history of mankind this scene was pregnant with a meaning which has steadily increased through succeeding generations.

Next Issue: *America On The Go*

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### **Belief Is Not Knowledge**

'The mightiest fact of modern times is that man now can build machines to do enough work, and has enough scientific mastery of nature's forces and materials, to lessen his poverty. Still more productive machinery and still more facts are certain to appear. . . . Not long ago no more goods could be produced than could be created by the muscles of men and animals, with slight help from wind and water. Now electricity, steam and petroleum—engine muscles—do immense work. Now precise facts about soil, metals, livestock, about all sorts of things, have taken the place of guesswork . . . Human mastery of nature is far from complete, but it has multiplied many times in the last two or three gen-

erations. Man's mastery of himself has some distance to go, too.'—Wheeler McMillen, editor of *Farm Journal* magazine, in Jan. 1944 issue. (He is the leader of Farm Chemurgy movement)

'We are getting to a point where beliefs and opinions are having less and less effect on the world's activities, but where *technological progress* and the great increase of technical departments in government . . . are beginning to impress even the public with the fact that *knowledge rather than belief* is needed to make the world go round . . . this technological age where the job rules, where results count.'—William B. Stout, Industrial Designer, in *Petroleum World*, 1/43.

# Technocracy and Your Trade

## WILL THE 'OKIES' RETURN?

by Pvt. Arland R. Meade

### *Out Where The Tall Corn Grows*

**A**N Iowa farmer has produced substantial evidence in support of Technocracy's analysis and predictions, according to a news release of the U. S. Department of Agriculture. The Rural Electrification Administration gave him an award for his accomplishment, the first award of its kind. Technocracy was not mentioned in the award, but the evidence by any other name would be just as technocratic. Here is the story.

Ralph Childs, of Manchester, Iowa made a very simple and fundamental step. Last year he traded two good flesh and blood hired men for 10,200 kilowatt hours. These 'electrical hired men' did not sit down; they did not get sick; they did not waste time arguing politics, or anything else. They did not take holidays with or without pay; they did not strike; they never had sore or tired muscles.

In fact they cooperated so well that as compared to the previous year Mr. Childs farmed 80 more acres; doubled the farm pig production; kept twice as many laying hens; brooded 500 more chicks; produced 7000 more pounds of butterfat; yielded 5,480 dozen more eggs; kept 45 more beef animals.

*Successful Farming* in its January, 1944 issue summed it up as follows:

'In short, the production of food units has jumped 370 percent on the average.' Electrification of the Childs farm had brought such an increase in production with such decrease in manpower used that the REA gave Mr. Childs a new award, and spread the news by press and radio to every state in the union.

The use of extraneous energy, that is, energy derived from inanimate sources had produced almost four times as much food as before and at the same time had freed two men for the armed forces. This is all to the good.

### *Keep What Home Fires Burning?*

But there comes a day of peace. And, do the two displaced men come back to resume their jobs? What jobs? The pumping of water for the cattle, a job which is being done by electric power at a minute fraction of the former cost? The mixing of feed, which is being done by fast-mixing machines operated by electricity? The sawing of wood? Turning a grindstone for sharpening tools?

No, they cannot resume jobs that are non-existent. Thanks to electrical energy, the farmer is producing much more with much less human labor. There is no need to rehire the displaced workers.



Try the neighboring farms? Same story. Well, get out of the dairy, the poultry houses, out to the bigger farms where there is open field work? Surely the long furrows are not electrified?

No, not entirely, but in America there is no escape from the use of extraneous energy. No longer are millions of men used to drive and care for millions of horses and mules, for tractors, using extraneous energy from fuel oil are rapidly eliminating the less efficient equine horsepower. From the first year of World War one to the first year of World War two nearly 12,000,000 of our horse and mule population disappeared. Their work is being done by fewer than 2,000,000 tractors. The 'Giddy-up-Whoa' jobs are rapidly receding into that limbo where went the 'Man With The Hoe', the 'long line skinner' and the itinerant harvest hand.

Perhaps our disemployed farm hands can all go down to the Sunny South and get jobs picking cotton? Surely this is a job that no machine will ever do—so we have been told. Can they? Echo answers, NO! Years of experimenting have been done on this tough problem and more than one successful machine has been built. On a California plantation (beg pardon, ranch), machine picking cost \$1.00 per 500 pound bale while hand picking cost \$32.00. Can labor compete with this machine under a Price System?

The International Harvester Co. is all set to start producing two-row and one-row cotton pickers as soon as war needs of critical metals are re-

laxed. Other companies are also set to produce cotton pickers as soon as priorities will permit. At the same time major changes are being made in cotton ginning. King Cotton's throne has long been shaky. It will fall completely when American armed might, created and backed by American technology, topples the thrones of the fascist states of Europe and Asia.

### *Tomorrow, Today Will Be Yesterday*

Should our farm workers turn to the city they will find the same trend at work, the displacement of human labor by extraneous energy, long ago predicted as certain by Technocracy. *Successful Farming* stated that the Childs farm at Manchester, Iowa 'experienced a revolution-bloodless, but as significant futurewise as the contests of the liberals in Spain or the fateful march of the hitlerites into Poland.'

Correct, and it is but a start. Ralph Childs farmed 80 more acres last year with less labor. That's the only way it can be done. Power farming, high power farming, will bring about the consolidation of large tracts of land into one operational whole. Agrotechnological farms 25 miles square are perfectly feasible. There, close to the source materials, in an agrochemical city in the center of the area, the products of the soil will be processed into plastics, industrial alcohol, synthetic rubber and so on through the list of products our science and technology can create for America, when the yoke of price and profit have been removed.

The two displaced workers on the Childs farm are but two of millions

in the same boat. They have millions of brothers in the urban areas. If they will read through the factual analysis as given in the *Technocracy Study Course* they will see how science and technology have created a problem that is new under the sun, and which cannot be solved at a price for a profit. The extension of science into the social field will not only remove the problem but will make America a land of peace and abundance. All labor as well as the farm worker has no other salvation.

The first step in that direction is the

Total Conscription of all resources and manpower into a unified and efficient war effort. Total Conscription for war will provide the groundwork for the transition to peace without the crisis—a dangerous one—of many millions of unemployed, urban and rural, roving our land seeking food and shelter.

Total Conscription of Men, Machines, Materiel and Money With National Service From All and Profit to None is the only program that will prevent a nation of 'Okies' in the not so distant future.

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### More Of The Same

A case cited (in the Rural Electrification Administration annual report) is that of a farmer in Cherokee County, Georgia, who spent 6 hours a day pumping and carrying water for 4,800 chickens.

'With electric service he increased his flock to 15,000 chickens. His electric pump brings the water to them and he has nearly all his time free for other farm tasks.' . . .

'Electricity,' the report states, 'has in many areas helped break production bottlenecks, especially where the pinch was felt in the exodus of skilled dairy and general farm hands. . . .'

The reports also calls attention to the substantial increase in average farm consumption of electricity, which average increase was 14 kilowatt-hours from June, 1942, to June 1943. In heavy food-producing states the average increase per farm went as high as 26 kilowatt-hours in some cases.

Although large-scale construction was virtually halted in the summer of 1942 because of the shortage of materials, the number of consumers served by REA borrowers increased more than 60,000, or 6.17 per cent, during the year ended June 30, 1943.

The increase, raising to 1,041,000 the total number served, is primarily the result of farm connections, authorized by the War Production Board to stimulate greater food production.—U.S.D.A. Release.

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'If America is to avoid unemployment and depression at the end of the war she must find some way of increasing production by \$50,000,000,000 over what it was in 1939. We have not the ghost of a blueprint to guide us.'—Leon Henderson. How about Total Conscription?



# In The Question Box

BY EDUCATION DIVISION 8741-1

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**This department consists of actual questions asked and answered at Technocracy meetings, plus those sent in by readers.**

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**D**O you know of any other way of of living besides the system where the people pay parasites to force the people to obey the parasites. A.D.

Yes we do! But first let us clearly understand what we both mean by parasites. You mean the kind of parasite that lives off another body—people that live without effort off profits, people that live through useless occupations, and people that live by outright crime and deception. These are the social parasites and we will deal with them later in our answer, but first let us point out that in relationship to our consumption of energy all of us Americans are parasites on the raw materials, energy and technology of this Continent. This is not said in a derogatory manner. It is just a way of expressing the fact that none of us return to society an equivalent in the energy or materials we consume.

This is because we are a technological society and physical wealth on this Continent is not produced by our physical effort. Ninety eight percent of all energy used as power in industry today in America, is derived from sources outside the human body. The

role of human labor in production and transportation is supervisory, attendant, or accessory to the machine itself.

Technology and the conversion of energy for industrial use are an outgrowth of that body of knowledge called science. Scientific knowledge grew up slowly over a long period of time and was contributed to by countless known and unknown individuals. It can be said that science is common property. Today in America our social structure has reached a point of development where it is a fact that all of us are parasites on the past, are beneficiaries of natural wealth created in the past plus the advance of scientific knowledge.

This is not meant to condone the anti-social activities of those you call parasites. They will presently be liquidated along with the rest of us if all of us North Americans don't get our heads together and agree to adopt a scientific design for operating all social activities.

When we do that A.D. we will have 'another way of living' much better for all than our present system. And, such a design is all worked out.

---

Isn't Total Conscription exactly the same thing that Germany and Japan have? G. B.

No! It's exactly the opposite. Germany and Japan have conscription of

men and women alone for the benefit of wealth and privilege.

Total Conscription includes everybody. It means National Service From All and Profits to None. No individual or group is exempt. It's a case of all for one and one for all. All fascist countries have conscription of labor, but no fascist country has Total Conscription.

---

If as you say, America has the lion's share of all the World's natural resources, would it not make future wars impossible if we kept the present war going until the resources of all our enemies are completely gone? J.H.

You forget that as large as America's resources are they are not limitless. If we kept this war up long enough the United States would find itself impoverished. Even now the end of our known oil and high grade iron ore is in sight. We must *conserve* our non-replaceable resources. But of course business does not recognize this fact. The question is do we want good business or a quick victory.

---

Is there a possibility that the Russian system may drift into Technocracy? R. C.

Russia still has a Price System but it has installed a controlled area technology. All of Russia's accomplishments are due to this technology and not to the ideology of its communism. Scarcity still exists in Russia, but as and when the per capita conversion of energy in Russia reaches a certain level it will abolish scarc-

ity and Russia will have to adopt a Technocratic system. It will be easier for Russia to change over than for us, but they will not reach it for a number of years.

---

Will Technocracy when put into operation reduce the selfishness of the people? E. N.

It all depends on what you mean by selfishness. If you mean a normal amount of self interest which does not have an anti-social effect, then, no. If you mean hoggishness, then, yes. You can't blame people for trying to get ahead under the Price System. It means economic security. In a technological control the present driving type of incentive to escape economic insecurity wouldn't arise. Economic security from birth to death would be guaranteed to every citizen as a right of citizenship. The acquisitive instinct would then be diverted into more socially useful channels, such as the desire to excel. This is a powerful urge, but doesn't get you very far under the Price System. Also in a technological control individual initiative would for the first time be free to express itself since all citizens would be guaranteed equal opportunity to demonstrate their ability.

---

If the American people are driven to action by collective necessity what will they do and how do you know they will do that? G. A.

We don't know what the people will do. That's just the trouble. If we did know for sure it would either be useless to state the social and war problem, or unnecessary. If we knew they



were going to kick over the apple cart and commit mass hari-kiri there wouldn't be any sense in wasting our time. We'd be out looking for a safe spot. If we were sure they would adopt Total Conscription it would be unnecessary to talk about it. Technocracy is an educational movement, not an organization of prophets. There is a big job to do. Why not pitch in and help?

---

Just how do you figure that Total Conscription will guarantee the future of America? E.F.

By eliminating the threat of fascism from without and the danger of fascism from within. With the threat of fascism removed social change can then proceed in an orderly manner. This will enable us to cope with the

---

One day a doctor, an engineer and a politician were arguing which of their professions was the oldest. The doctor said: 'Mine is the oldest profession because the Bible records that Eve was created from one of Adam's ribs. That was a surgical operation.' You're behind the times,' said the engineer, 'my profession is much older. In the Book of Genesis it says that order was brought out of chaos. That was an engineering achievement.'

'Just a minute,' exclaimed the politician. 'I have the edge on both of you. The doctor may have performed the first operation and my

problems of the postwar period more effectually.

Price System methods failed to solve the problems of the long depression. Now we are waging total war with Price System methods. Victory will come in spite of their use and not because of them. It will come because of the sacrifices of our soldiers at the front and the efficiency of our technology at home. Then after the war we will come face to face with the perilous post-war period with nothing but Price System methods to lean upon. That sort of outlook is very dismal, indeed.

Total Conscription will dispense with Price System methods for the duration. That's how it will guarantee the future of America.

#### *Note To Our Readers*

Send in your questions we'll do our best to answer them.

---

friend, the engineer, may have brought order out of chaos. But who do you think created that chaos?'

---

Describing the results of bombing on modern industrial cities in this war an editorial in the *Chicago Daily News* for June 4, 1943 states '... this is a civilization dominated more by the second law of thermodynamics than by the arithmetical laws of interest.' For an explanation of this physical law consult *Technocracy Study Course Book*, pages 39 to 50, also Introduction to Technocracy page 5.

## MONKEYS AIN'T SO DUMB!

Three monkeys sat in a cocoanut tree,  
Discussing things as they're said to be;  
Said one to the others, Now, listen, you two,  
There's a certain rumor that can't be true  
That man descended from our noble race.  
The very idea. It's a bare disgrace.  
No monkey ever deserted his wife,  
And you've never known a mother monk  
To leave the babies with others to bunk,  
Or pass them from one to another,  
Till they scarcely know who is their mother.  
And another thing: You'll never see  
A monk build a fence 'round a cocoanut tree,

And let the cocoanuts go to waste,  
Forbidding all others a taste.  
Why, if I put a fence around this tree,  
Starvation would force you to steal from me!

Here's another thing a monk won't do:  
Go out at night and get on a stew,  
Or use a gun, or club, or knife,  
To take some other monkey's life.  
Yes, man descended, the ornery cuss,  
But, brothers, he didn't descend from us.

—From *Desert Salute*

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'When everybody is working it is not hard to be a statesman.' Samuel Grafton, *Chicago Sun* 12/18/43.

'Whether in cities or on the land, the millions of restless unemployed Americans challenge us to do something constructive to meet the problem they represent. It is a problem that lies at the very root of all our world troubles. For we are in a world revolution. We are passing from our age-old era of scarcity to an era of abundance made available to us by our marvelous scientific achievements in the field of production. The conflict in the world today both within our nation and without, is man's struggle for mastery of his own machines. These unemployed people in the cities and on the land are crumbs of the machine—of modern large-scale production. They are what they are because our generation has not learned to live with abundance, and until mankind has learned how to do this, we shall have unemployment, distress, revolution, and WAR.'

R. M. Evans, U.S.,  
Dept. of Agriculture,  
Washington conference  
in July, 1941.

Private business persisted in selling materials of war to Japan. First quarter of 1941, U. S. sent Japan 8,314,000 pounds of lead; 1,097,000 barrels of gasoline; also copper and machinery, in some cases tripling the exports of the same period in 1940. This was good business.

'It may be that in its widest sense on its material side history is the story of man's increasing ability to control energy.' James Fairgrieve, *Geography and World Power*, 191



# TECHNOCRACY

## WHAT?

### WHAT?

★ Technocracy is the only American social movement with an American program which has become widespread in America. It has no affiliation with any other organization, group or association either in America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 25 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are \$6.00 which are paid by the member to his local section.

★ Members wear the chromium and vermillion insignia of Technocracy—the Mond, an ancient generic symbol signifying balance.

### WHERE?

★ There are units and members of Technocracy in almost every State, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Victory Program with any interested people and Continental Headquarters will be pleased to inform anyone of the location of the nearest Technocracy unit.

## WHERE?

## WHEN?

### WHEN?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance—a research organization. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

### WHO?

★ Technocracy was built in America by Americans. It is composed of American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this country. Membership is open only to American citizens. Aliens, Asiatics and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife—as long as you are a patriotic American—you are welcome in Technocracy.

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106 W. Randolph Street,  
Chicago 6, Illinois

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9. Preserve America's dwindling natural resources
10. Provide a high standard of living for all
11. Install technological controls for technological war
12. Underwrite the perilous post-war period ahead
13. Guarantee the greater future of America

Here is a baker's dozen of fundamental necessities for Total Conscription. This design is now called for by the trend of events. Yesterday is gone—today is rapidly slipping by—Tomorrow never comes.

Put on your thinking caps, Mr. and Mrs. American.

**INVESTIGATE TECHNOCRACY**



# GREAT LAKES TECHNOCRAT

R. S. CAMERON

25c

MAY-JUNE, 1944

25c

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# GREAT LAKES TECHNOCRAT

MAY-JUNE, 1944



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No. 10



WHOLE NO. 67



Illustrating the Futility of Price System Methods of Operation; Interpreting the Trend of Events from the Social Aspect of Science; and Presenting the Specifications for Total Victory in America's War Against Fascism.



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# The Four Freedoms—Whose?

by Alice Langan

Perhaps sometime in the future some student will pore over the social records of the first half of the 20th Century. He will consider the thousands of facts illuminating the actual operations of our system today. He will wonder how any people could be so unheeding of, and blind to, the social phenomena of their own time.

The answer is propaganda. Facts are not easy to uncover and the propaganda of the Price System is ever present to distract our attention. Here is a mechanized army of facts brought to bear upon the great, unrealized concepts of the Four Freedoms. We cannot afford to wait for the future to learn about the present. Here are the facts about the Four Freedoms. Count them, one by one.

## Four Times Zero Is Zero

SINCE the Four Freedoms have been played up for us on Norman Rockwell's four famous paintings and since they have been immortalized on a penny stamp, we've all got a mental concept of what these freedoms are. But what do we mean by 'Freedom'? Can we define it? Since it is an abstract concept and means one thing to you and a different thing to me, there can be no agreement as to what the word itself means. Freedom can mean anything we want it to mean without having any relationship to things and events in the physical world. However, since we are limiting our choice of freedoms to four; namely, Freedom of Speech, Freedom of Religion, Freedom from Want and Freedom from Fear, we are narrowing our choice.

To retain or achieve these Four Freedoms, we've got to connect them up with the Price System under which we live, and the definition of a Price

System is exact and clear, as follows:

*A Price System is any social system whatsoever that effects its distribution of goods and services by means of a system of trade or commerce based on commodity valuation and employing any form of debt tokens, or money, as a medium of exchange.*

Do we live under that kind of a system today? I think we can all agree that we do.

We are told that we are fighting for the Four Freedoms; that we are fighting to 'preserve' them. If the Four Freedoms have become our slogan, our battle cry, they must indeed be desirable; we must be willing to hang onto them at all costs and preserve them for our children and their children after them.

Did we ever look at the facts to see how much of those Four Freedoms we have had in the past? Let's take a look at these freedoms as we have had them in America under the operation of a Price System.

A *fact* is a close agreement of a series of observations of the same phenomenon.

Unlike the abstract concepts of the Four Freedoms, a fact has exactly the same significance to all of us.

### *Freedom of Speech*

Dr. Theodore Schultz, recently of Iowa State College, was dismissed from the faculty because he dared to state that oleomargarine was as good as butter. He has made 'revolutionary' statements before, but this one ran smack into the big butter industry. Freedom of Speech cost Schultz his job.

We are still teaching our children by the spoken and written word the 'glory' of work in this day of technology. We have been so successful in instilling in them the principles of fascism, based on the use of human toil and hand tool methods, that some 750,000 children under 16 years of age are at present holding full-time jobs. To those who dare to give them the facts about America, to demonstrate that human toil and hand tool methods have been on their way out for 25 years, it means social or economic ostracism. Freedom of Speech is for those who uphold the status quo.

Freedom of Speech and the press originally meant the right of any man or set of men to buy type, presses and paper and print their favored 'opinions.' It was more of a political than a commercial freedom when the first amendment to our Constitution was written. Now, we all know that the major newspapers are organs of

propaganda for business interests.

Freedom of Speech—what has it meant to the children of our great nation? What have they been taught? Have they ever learned that America has the lion's share of the world's known natural resources; 76 percent of the skilled personnel; great installations of horsepower of energy and only 9 percent of the world's population? No, of course not! They are conditioned by their text books early in life in the 'business' psychology, with examples such as this: If a cow gives 10 quarts of milk a day and each quart sells for 10 cents how much money would you receive? Never are they conditioned by their text books to solve the problem from a *distribution* point of view; for example: If a cow gives 10 quarts of milk a day and one quart feeds one baby, how many babies can one cow feed?

### *Freedom of Religion*

The statement long since made by Howard Scott that if we took the mortgage off the outside of the church and the collection plate from the inside, we would for the first time have Freedom of Religion, is still correct. Of course, we cannot hope to achieve this under a Price System.

### *Freedom from Want and Fear*

These two freedoms are the freedoms we're really concerned about. Freedom from want and freedom from fear deal with fundamentals of our lives, with the purchasing power which we must acquire in order to exist under the Price System. Our



boys are fighting to preserve the 'American Way' which presumably includes these two freedoms. Let us, then, examine what freedom from want and freedom from fear mean and have meant to most Americans under the operation of a Price System.

One thing is certain, under this Price System we must obtain a medium of exchange, or money, in order to get anything at all; and in order to do that we must sell something first. We sell our man-hours of labor to the highest bidder, and for those man-hours of labor we get debt certificates, or money, in exchange. This purchasing power now is absolutely necessary; if we do not have it, we simply do not eat and we suffer from both want and fear.

Up to the year 1939, one-third of all families in the United States got less than \$1000 per year to support an average family of four people. One-tenth of one percent of the families at the top received as much as 42 percent of the families at the bottom of the economic ladder. Incredible, you may think. These are Government figures. There's no guesswork here. Well, you'll say, it's different now. Different, because we are in a war boom? In March of 1941, a reasonably good year for employment (when we had just started on the supplying of war goods to others), 2,106,448 old people were receiving assistance; aid to dependent children was being paid to 935,202 children; over a million cases (most of them families) were receiving general poor relief. Probably 15 million persons, men, women and children,

were receiving assistance, which they could have received only after proving lack of money to pay for the bare necessities of life. That number was more than 10 percent of the population, in comparatively prosperous 1941. The national income in 1941 was estimated by the United States Department of Commerce to be about \$92,000,000,000. That is 10 billions more than it was in the fabled year of 1929.

The war boom, after we got into it, raised the income of many families, you'll assert. Did it? Not much, for 60 percent of the American people make no more than they did before the war, and some actually get less. Yes, there are more people employed, but the average wage is only \$45 a week; and many, many Americans get much less than that. Teachers, for instance, those who are entrusted with educating our children, surely they're pretty well paid! In Illinois in 1943, the average wage per year for a teacher was \$1700; in Iowa it was only \$1017 per year.

In the first 15 days of December 1943, war bonds were being cashed in at the rate of 27.2 percent of current sales. This was a rise of 5.8 percent over November 1943 cashings, the rate then being 21.4 percent of current sales. A Gallup poll in July 1943 showed that 19 percent of American families had bought no war stamps up to that date; and another poll in October 1943 revealed that 13 million American families still owned no war bonds. Here is a substantial block of Americans without any war prosperity savings to tide

them over the 'reconversion' period.

The Chicago Office of the Wage and Hour Division of the U. S. Department of Labor, in a recent study, reported on March 14, 1944, that 75,000 workers in Illinois, Indiana and Wisconsin are paid less than 40 cents an hour; or a maximum of \$16 per week for a 40 hour week. The Office of War Information stated a few months ago that some 20 million American families were facing steadily lowered living standards. The Illinois Social Security Board in August 1943 had 146,000 old-age pensioners; they received the magnificent sum of \$28.91 per month, not as a right but, as Governor Green called it, a 'handout.' The Chicago Community Fund alone cared for 10,000 children. Freedom from Want and Freedom from Fear! When did these Americans have it?

*'Oh! Promise Me—'*

While many Americans were unable to sell their man-hours of labor in the depression years, was Freedom from Want and Freedom from Fear guaranteed them by 'free enterprise'? Indeed not! The Price System simply doesn't operate that way. We must remember that the *sole interest of business is making money*. Food, in the midst of terrible hunger in 1932, 1933, 1934, was destroyed; oranges sprayed with a poisonous substance which affected human beings but not animals; pigs were killed; cotton plowed under; coffee and bananas thrown overboard.

Amidst all the glowing promises for future Freedom from Want and

Freedom from Fear, the house of the postwar period is beautifully sketched, with its kitchen particularly free from human toil and hand tool methods. Both in the war and prewar period, however, in America, three out of ten houses were below a standard of decency. In Chicago, we have only 36 square miles of so-called 'stable' housing, while we have 10 square miles of completely blighted property; 12 square miles of nearly blighted houses; 11 square miles of 'arrested' blight. The war is the excuse now given for not building decent houses or any houses, and in peacetime the excuse given was a long story as to why we couldn't do it profitably and practically. In February 1944 a family of four in Chicago was evicted because they could not scrape together \$39 to pay for the rent for February and part of January; the father had just been inducted into the Navy and the first allotment had not been received. Who is enjoying Freedom from Want in this condition of indecent housing!

During the years that 'surplus' food was destroyed, not because Americans could not have enjoyed eating it, but because they didn't have the price to pay for it, the young men, who in 1942 were inducted into the Army, were children, 10 to 14 years of age. It was found when they were conscripted into the Armed Services in 1942 that 42 percent, or almost half of those young men, were suffering from diseases of malnutrition. Where was the Freedom from Want in *their* formative years?

Our educational system, that's one



place at least where we dispel fear, we're sure of that. Only 15 percent of American children, however, ever go to college, and we have almost as many illiterates as we have college graduates. One million men were rejected by the Army because they could neither read nor write; and most of these men were under 30 years of age.

This is America as it is. Freedom from Want and Freedom from Fear? To the great majority of Americans, these are but dreams which some day they hope their children *may* achieve. Will they? Under the operations of a Price System, with its present heavy burden of taxes, about the only thing we can be sure of handing down to our children is the certainty of at least 30 years of heavy taxes and the further necessity of purchasing 'peace' bonds. This course will insure to the operators of the Price System the continued assurance of business-as-usual and profits-as-usual. Are we willing to condemn our children to an even lower living standard than our own, simply because we insist upon maintaining the system of 'free enterprise'?

### *Man-Hours Must Decline*

Freedom from Want and Freedom from Fear cannot possibly be guaranteed to any of us under the operations of a Price System, because that system itself decrees that an individual must sell his or her man-hours of labor to obtain the necessary medium of exchange. The factor which mitigates against the achievement of these two freedoms is the simple,

physical factor that man-hours per unit must continue to decline, if we continue to use modern technology.

About 100 years ago, 98 percent of all the work done on the North American Continent was done by human muscles and hand tools. The man-hours per unit were many. Gradually, as we introduced the use of extraneous energy or technology, we used less and less human muscles, until today we've arrived at a state where approximately only 2 percent of the work on this Continent is performed by human muscles and hand tools, while 98 percent is performed by extraneous energy or technology. In the physical world of reality, this is exactly the reverse of the conditions 100 years ago. This physical factor should have altered all our abstract concepts about the 'glory' of work or that man labors and gains by the sweat of his brow. The old philosophy that 'the harder we work, the more we get' is entirely out of place in our society today. The fact is that the less man works, the greater becomes our technological capacity to produce an abundance of goods and services.

The displacement of man-hours of labor is a universal symptom of the Price System. It has been going on apace for the last 25 years; we can point out only a few examples of the inevitable displacement of man-hours of labor as we introduced more and better technological methods and processes.

Some 85,000 men were permanently displaced when the modern

strip and sheet mill was introduced.

In 1937, 8 million people were dependent for their livelihood on the picking of 125 to 150 pounds of cotton per day per worker. Today, International Harvester Co. has a machine which picks 1000 pounds of cotton *per hour* with only 2 men.

The Armstrong Linoleum Company boasts that not a single human hand touches inlaid linoleum. Only 3 men *inspect* it after it comes out of the machine.

A warehouse which once employed a force of girls to sort beans by hand today depends entirely on the electric eye which never misses a single speckled bean and doesn't collect wages, get tired or go on strike.

Two men, aided by machinery, can load 1000 tons of coal a day.

The Illinois Department of Conservation, Division of Forestry, last spring used a tree-planting machine for the first time; 600 trees per hour were planted and only *one* man was needed to run the machine.

Railroads are hauling 49.2 percent more ton-miles of freight; 80 percent more passenger miles per mile of line than they did in 1929; with 23.5 percent fewer employees.

The Standard Oil Plant at Linden, N. J., employs only 9 men in a 20 story building, cracking high octane gasoline. It is expected to reduce even this number of men very shortly.

Charles E. Wilson, Chairman of the War Production Board's Aircraft Division, on February 15, 1944, stated that a four-motored bomber which once required 200,000 man-hours now comes off the assembly line in

13,000 man-hours; while an early fighter type which took 157,000 man-hours requires only 7,800 man-hours. The P-38 is produced on a continuously moving assembly line; and while it required 8 days to install, it doubled the output and meant 40 percent reduction in man-hours per plane. Mr. Wilson also paid tribute to mass production achievements, stating that a plane came off the assembly line every 15 minutes of the working day.

The Defense Plant Corporation of the United States Government built a steel mill at New Geneva, Utah. The motor being installed to drive the machines was designed to cut 10 ton steel slabs into 200 foot lengths. It has the power of 70,000 men.

Kearney & Trecker Corporation of Milwaukee in an ad in *News Week* of January 17, 1944, had this statement:

Research reveals that in the 12 years, 1929-1941, the nation's output per man-hour increased 34 percent. And there is ample evidence accumulating that the rate will advance to at least 40 percent. War—the supreme National productive effort it calls for—accelerates man-hour output. Improved production techniques—developed in war—carry over into peacetime.

Bror Dahlberg, President of the Celotex Corporation, at the Annual Meeting of Stockholders, held January 18, 1944, reported to the shareholders that the South Coast Co. (a subsidiary) would report a profit for the fiscal year to end Jan. 31, 1944,



due in part to the fact that it harvested its sugar cane crop by machinery. Previously, said Mr. Dahlberg, the company had been forced to import 3,000 to 5,000 workers during the grinding season, 'which was a very expensive procedure.' What happened to the 5,000 workers, of course, was immaterial, because the Price System does not operate for the general welfare of the human components involved; it operates for the purpose of getting a 'price' on articles produced, not for the providing of jobs.

Henry Kaiser, that mass-production genius, has come forward with the best suggestion of all. He suggests that the Government give new contracts *only* to those manufacturers who produce with the FEWEST MAN-HOURS PER UNIT.

### *More Goods Means Less Jobs*

Man-hours per unit is declining; consequently total man-hours must decrease from now on. The decrease in man-hours will take the form of reduced hours per week and isolated lay-offs. Richard V. Gilbert, economic adviser to the OPA, says a shift from a 48-hour week, with its attendant overtime pay, to a 40-hour week 'will entail a cut of just under 25% in weekly take-home wages.' The lay-offs will spread and increase gradually into mass unemployment. These events may not become critical as long as the war lasts, but the significant thing is that they are under way while the war is still in progress!

Nine small arms plants have already closed; we have enough ammunition on hand to last for several years.

Steel plants and fabricators, in November 1943 were beginning to lay off hundreds of workers. In Detroit tanks are being made faster than storage space can be found for them, so wondrous are the mass production methods. Three hundred thousand workers on the Federal pay-rolls are to be dismissed. The Buick plant in Melrose Park, Illinois, laid off about 3,000 workers and is cutting the hours of those retained to 48 per week. Studebaker plants in Chicago and South Bend, Ind., closed 'temporarily' to take inventory. The Twentieth Century Fund estimates that after the war the nation will have plants producing twice the durable goods American consumers ever had the capacity to BUY before.

The promises of a rosy future contained in the ads which hold out new processes as being able to achieve Freedom from Want and Freedom from Fear should be carefully considered by all thinking Americans. If you take just one of those processes, synthetic rubber, for instance, we find that the requirements of the United States and Canada can be produced by 18,000 employes in only 46 plants. One plant at Institute, W. Va., alone can produce one-seventh of the United States needs; employing only 1,250 people. It used to take a labor force of 90,000 men, 24,000,000 trees and a plantation of 270,000 acres before to produce the same quantity of natural rubber.

The machine tool industry is outdoing itself in a series of ads, depicting that particular industry as the life-saver after the war. The Federal Reserve Bank report made in Chicago last June, however, stated that the United States Government alone owns machine tools equal to 10 years normal output and that the machine tool industry has satiated its markets for a quarter of a century, at least until 1960.

Even while the war is going on, total employment is already dropping. The National Industrial Conference Board, a private research organization, found that during November 1943 the total number of persons at work or in the armed forces dropped 1,200,000. The Board estimated that from the record high of 64,400,000 employed in September, the total dropped to 63,100,000 in November. In January 1944 unemployment benefits were 20.1 percent over those paid out for December 1943. January employment in the country was down 1,700,000 as compared with December 1943.

The Post-War Economic Advisory Council of Chicago in October 1943 warned the businessmen of this area that thousands of industries will find themselves with unfinished contracts and huge investments at the end of the war; that unless immediate reimbursement is provided for them, many will have to go into bankruptcy. Naturally, if that happens, the employees go into bankruptcy with their employers. Phillip Harrington, Chicago Commissioner of Subways and Super-Highways, predicted on February 9,

1944, that there would be some 800,000 Chicagoans left jobless when the war ends.

### *'Straight From The Horse's Mouth'*

Henry R. Luce, editor of *Life Magazine*, June 3, 1940, in that magazine, said:

What I am willing to fight for is, of course, America, but not America as a geologic mass; not for its mountains and plains and rivers, greatly though I love them and much though they have concerned me. The America I want to fight for is the America of freedom and justice, the America which has stood throughout the world for the hopes of progress in the democratic way of life, and for faith in the ultimate brotherhood of man.

Mr. Luce's America is the America of less than 3 million people. The other 130 million have their America; the America of mountains, plains, forests, rivers and streams—*without* sufficient purchasing power to purchase freedom and justice.

Perhaps that is what the *Nation* meant when it said on April 4, 1942:

Our war production drive is making the country increasingly conscious that it has the industrial capacity for a system of abundance; and a postwar depression could easily cause millions of 'technology conscious' unemployed, cynical about democracy and the four freedoms,



to consider **TECHNOCRACY** a solution. Perhaps Scott is preparing for that day when he tells people that they cannot wear freedom, cannot eat justice and cannot ride in liberty.

While most Americans are eagerly looking forward to full employment and a high standard of living after the war, some of the commentators in our 'free press' long ago have made it very clear what business thinks about that kind of 'looking forward.' As early as January 23, 1940, Haney in the Los Angeles Evening Journal said:

Some recent testimony before the Monopoly Committee at Washington . . . was that the objective of cooperation within a particular business should be the *continuation of employment*, keeping mills and factories running. It is about as communistic a doctrine as any Karl Marx ever propounded. If acted upon, it would put a company out of business so fast that the ticker tape could not take care of the rush to sell its stock. Any time a business is run to keep its mills running, it becomes meaningless. Any concern which has as its objective the giving of employment is likely to do just that 'give it.' It would *not* be business.

That expired hope of the 'progressive Republicans' Wendell Willkie, way back in 1940, August 29th, to be exact, said:

It is said that if men are to be

conscripted, wealth must be conscripted. If this statement is taken literally . . . I cannot understand what we are undertaking to defend.

John F. Fennelly, Investment Banker, on November 4, 1943, stated:

Full employment would be incompatible with the *free enterprise system* which carried with it the *right to a normal float of unemployed*. (Italics ours).

Banker's Magazine of London makes it even more concrete, for it states that 'workers of the future will require fears of unemployment and poverty to ensure the necessary drive in this world of . . . competition.'

From a U. S. Naval Hospital, New River, N. C., comes a letter from a sailor, which voices the thought and concern of most Americans, at least approximately 98 percent of us:

One of the things nearest and dearest to any service man is whether or not postwar employment will be handled as it should. After the last war we received only promises—unfulfilled. These you cannot eat nor can your family.

While 98 percent of us are concerned with Freedom from Want and Freedom from Fear in the postwar era, and consider that to be what we are fighting for, the 2 percent, the operators of the Price System, who are its beneficiaries now and expect to be its beneficiaries then, leave us not long in doubt as to their contempt for any such achievement. Frederick C. Crawford, President of the National Association of Manu-

facturers, in December 1943 described the Four Freedoms as negative and fit only for men in jail, and called upon business to take over postwar leadership. Said Crawford:

The planners have asked us to drop freedom of opportunity in the material world and substitute two *negative* freedoms—freedom from fear and freedom from want. The very expressions imply statism, that the state or somebody will do something for us, organize our lives. Only a man in jail can enjoy the Four Freedoms.

And McClure's *National Whirlgig*, for December 13, 1943, made it very clear what they thought about all these promises of Freedom from Want and Freedom from Fear, for they said:

Men who meet payrolls are strong for the public's getting down to earth and abandoning the dream that after the war there will be a job for everyone able and willing to work. If this will-o-the-wisp idea persists and private enterprise is later unable to deliver, disillusioned laborers will think that a solemn promise has been broken. Every soapbox demagogue in the country will blame big business. Victory plant bosses have boundless confidence that they can raise postbellum productivity to around a third above former peacetime levels. But they warn that 100% employment and full factory capacity are as yet unattainable . . . that objective is not only

beyond reach but is also socially undesirable. The management group suspects left-wing economists of deliberately fostering the chimera that everyone will be kept busy, in the desire to see business fail to make good and the government step in with socialistic schemes.

The final plea to face facts and reality is made by Paul G. Hoffman, President of Studebaker Corporation, who at the National Association of Manufacturers Congress of Industry in New York City on December 10, 1943, said:

If all of us keep talking about jobs for all, 2 or 3 million people may accuse us some day of making promises we didn't keep. If full employment means a job for every man and woman who is willing and able to work, then it is not desirable or necessary in a fine functioning economy. Let's stop using the words 'full production, full employment, and jobs for all.'

### *A Price System Can't Deliver the Goods*

The President of the Studebaker Corporation is quite correct in asking us to stop using the words 'full production, full employment and jobs for all' for we cannot expect to achieve those objectives under a Price System, geared to scarcity, not to abundance.

In the midst of our war boom, the



pattern of Technocracy's social analysis is beginning to reappear to the alarm of the upholders of the status quo. Where, asks an Associated Press writer, can we sell 90,000 planes a year in peace? How can we keep 63,000,000 people employed? How can we keep the national income up to \$155 billion a year? Echo answers, How?

There are some of our leaders who do see the trend of events, who are aware of the physical factors entering into the picture of guaranteeing Freedom from Want and Freedom from Fear.

Millard W. Rice, National Service Director, Disabled American Veterans, on February 24th made the startling estimate that only about 20 percent of our returning war veterans will be reinstated in their former jobs. In support of his belief that 80 percent of discharged veterans will have to find new jobs, Rice broke up that percentage this way: Five percent of the discharges had no jobs at the time they were inducted or volunteered; 25 percent came from jobs previously occupied by other service men; 25 percent will find jobs 'abolished by business failures, changes and technological development,' and another 25 percent will fail to apply within 40 days after their discharge for reinstatement to their former jobs.

R. I. Ingalls, Sr., Chairman of the Ingalls Iron Works Company of Birmingham, Ala., on March 13th in an interview with a newspaper correspondent, stated that: 'I do not think there will promptly be a job

for everybody.' He added one other worry to those already facing us, namely, that 'the matter of management's cutting its overhead will not be one of choice, but of necessity . . . and this cutting of overhead will call for dismissal of a great many good and loyal employes which cannot be prevented.'

Do these statements sound like a guarantee of Freedom from Want and Freedom from Fear?

James L. Palmer, the first vice-president of Marshall Field & Co., at a luncheon in Chicago on January 7, 1944, stated that: 'Business cannot single-handed successfully carry out postwar plans for an employment goal of 55,000,000.' He further said: 'The philosophy of scarcity must be abandoned in postwar thinking.' Mr. Palmer warned his audience that it is a fallacy for business to presume that the free enterprise system will be continued in this country after the war simply because it has distinguished itself during the conflict. 'Industry has by no means proved its ability to do a similarly incredible job of producing in peace time in genuinely free and competitive conditions,' he said, stating that the real test is yet to come and it will be a 'colossal' one.

One of the so-called 'Bureaucrats' however, strikes the keynote which will guarantee freedom from want and freedom from fear to all Americans. Maj. Gen. Philip B. Fleming, Administrator, Federal Works Agency, in an address at the Edgewater Beach Hotel, Chicago, on January 18, 1944, stated that the postwar readjustment threatened a national crisis

involving possibly one-half of the population and representing a national responsibility which must be treated as such. Maj. Fleming asserted that the demobilization of 11,000,000 men in the Armed services and at least 15,000,000 men and women engaged in war work may bring an economic, social and political crisis of dimensions never before faced in peacetime, and he urged that the government *MUST* make sure that planning is done, and *DONE IN TIME*.

### *There's Only One Guarantee*

Sooner or later the war must stop. To date not one single person, agency or corporation has had the courage to make the affirmative statement that this Continent is facing inevitable social change and that we must *prepare* for it; not *fight* it. All postwar planning up to now has as its prime purpose the preservation of the status quo. Only one organization, TECH-NOCRACY INC., has recognized that social change is inevitable. Technocracy Inc. has no postwar plan because Technocracy itself is a permanent plan for America. Technocracy's design for Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None is the only program which is measured to the sweeping changes which have already taken place. Total Conscription means exactly what the two words imply, *TOTAL*, or the entire, conscription of *ALL*, which does not mean labor alone, but also machines, materiel and money. This

is the opposite of fascism whereunder men and women alone are conscripted for the benefit of wealth and privilege.

Total Conscription would guarantee an orderly transition from war to peace, and all Americans would, during that period, have Freedom from Want and Fear, because the design provides for abundance. The design of Total Conscription could be installed by the Congress of the United States, and constitutionally by our Commander-in-Chief, Franklin D. Roosevelt; in fact, the plan could be installed overnight under the provisions of the Constitution and the laws of the land.

Americans must become aware of the need for such a program; the only plan which *could* assure all of us those freedoms we most ardently desire; and they must use their rights as citizens to bring it before their Government. The pressure of physical events has already made Total Conscription necessary, and an informed public will *DEMAND* and *ACHIEVE* its adoption.

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'When the present war ends, every country that has been involved in it will be faced by an economic dislocation so severe as to bring an immediate danger of widespread destitution. This *common danger*, if not handled wisely, will cause many more deaths than are being caused by enemy action.' *Fortune* December 1943 (*italics ours*).



— CONSTRUCTION OF PUBLIC BUILDINGS IN CONTINENTAL U.S.  
— " " COMMERCIAL " " " "

Research expenditures in millions of dollars from 1925 to 1943. The chart shows a significant increase in spending starting in the late 1930s, peaking in 1942 at nearly 6000 million dollars.

Year	Expenditure (Millions of Dollars)
1925	100
1926	100
1927	100
1928	100
1929	100
1930	100
1931	100
1932	100
1933	100
1934	100
1935	100
1936	100
1937	100
1938	100
1939	100
1940	100
1941	100
1942	100
1943	100

# The 'Revolt' of Professor Fishwiggle

Botany and the National Debt

by Lilly Yngve

*Scene: Any College Class Room*

'IS it clear to everyone,' said the professor in Botany, 'that a fungus is a one-cell plant? As a matter of fact, it is one of the simplest forms in the vegetable kingdom. Can one of you give me an example of plants classified as Fungi?'

'Correct, Thompson, yeast is a fungus, and it multiplies rapidly when placed in a favorable medium. There are approximately 250,000 fungi. Name a few more varieties.'

Thompson: 'Mildews, smuts, rusts, molds and our National Debt.'

Professor: 'Did I hear you say National Debt? This is certainly no time for levity.'

Thompson: 'I'm serious, and I'm willing to prove that our National Debt can be classified as a Fungus.'

Professor: 'My dear students, before we recommend Thompson for a padded cell, we will give him an opportunity to explain his biological phenomenon; after all there is such a thing as investigation before condemnation. Proceed!'

Thompson: 'In 1835 our nation was practically free from indebtedness and owed only \$33,513.05, which is close to nothing; we will call it zero. Like the fungus which lacks chlorophyl, and consequently cannot manufacture its own food but must

subsist on either living plants or animals (called parasites) or on dead or decaying things (saprophytic fungi) our National Debt depends on living bodies (homo sapiens) and on decaying things such as the Price System for its existence and growth.'

Professor: 'Just what do you mean by a Price System.'

Thompson: 'Any social system whatsoever that effects its distribution of goods and services by means of a system of trade or commerce based on commodity valuation and employing any form of debt tokens, or money, constitutes a Price System.'

Professor: 'How can you speak of the Price System, which our forefathers have handed down to us and which has served this nation for hundreds of years, as a decaying thing?'

Thompson: 'When the white men landed on this Continent of natural abundance, they brought with them their European concept of a *scarcity* economy. That is a system which places a high value on commodities which are scarce, thus putting a big price tag on them, and a low tag if that same commodity can be produced in quantity.'

'From the earliest stages of civilization and up to the time of the Industrial Revolution, our almost purely agrarian population was engaged in national drudgery. That was the time when father built his own house, shod



his own horses, was his own tanner, mason and farmer and did everything the hard way, and the time when mother spun the flax and dipped the candles, stitched the clothes, milked the cows, carried the water from the well, scrubbed the floors, and knew very well, indeed, that woman's place was to stand by the stove and give birth to children. Well, during this time of hand tools and hand methods, which backward people of today are looking "forward" to, the Price System was equal to meet the simple needs of the population. Besides that, there was no other system available.

'Before the birth of technology, *circa*, anno Domini 1840, the National Debt remained at the degree of zero.

'Coming back to the saprophitic Fungus, we know that it requires a favorable medium in order to grow. The Mexican War and the War of Secession provided a favorable medium for our National Debt, causing an increase from \$33,513.05 to \$2,755,764,000, in 1866.

'At the entry of the First World War, April 1917, the United States had a debt of \$2,975,619,000. One year later we could chalk up \$12,243,629,000; and 1919 boosted the figures to \$25,482,034,000. This "debt spurt" was due to various taxes and the sale of Liberty and Victory Bonds, which was necessary in order to pay corporate enterprise for the great war expenditures.

'1918 found the Price System suffering from a rare ailment, never before encountered in social history, causing the men responsible for its well-being great anxiety. President

Wilson and his administration (who were the guardians) called the cream of the intelligence of the nation together and formed the War Industries Board. They studied the Price System's new disease from various angles, but were at a loss to account for its behavior which expressed itself by a great increase in production and a decrease in employment.

'In 1919, however, a group of scientists, engineers and technicians, some of whom had been on the War Industries Board earlier, took it upon themselves to find the "cause." The entire North American Continent became their laboratory. The Price System was laid on the table and thoroughly examined. It was weighed and found wanting. Fever charts were kept and the oscillations on those charts were alarming. Here was something new in social pathology.

'The scientists pointed out that the Price System was in a state of decay; as a matter of fact, it was on its last leg. Blood transfusions in the form of subsidies, the plowing under of agricultural products, premature killing of pigs, the birth of the WPA, NRA, CCC, etc., loans to Europe and installment buying kept the Price System precariously hobbling along toward an uncertain future, mortgaged by ever higher and higher mountains of debt.

'The National Debt thrived. Some of the people paid taxes *all* of the time, and others paid taxes *some* of the time, and a few evaded taxes and *served* time.

'Man-hours per unit went down and

total industrial man-hours declined, but production still soared because the wheels of industry rotated faster and faster.

'Machines diminished in size and became more powerful and efficient, but were never allowed to run at full load capacity because that would flood the market, causing values to go down, prices to drop, homo sapiens to go out of business and on relief, and the National Debt to soar even higher.

'We sought other markets in distant lands for the products of our industry. We quenched the thirst of their engines with our precious oil; we were very thrifty in gathering our scrap iron and sending it to Japan. Business must go on! Private Enterprise must flourish! The Price System must live!'

Professor: 'I don't know what to say! This is very unusual but interesting. I agree with you, the National Debt is a fungus and when I look at my income tax I'm inclined, if possible, to agree with you still more.'

Thompson: 'If we continue to conduct the present war with business methods, America will be bogged down under a debt that will sap the nation's blood stream down to the third and fourth generation. This blood stream will become thinner and thinner as Americans become more and more anemic. Every American will give up some of his purchasing power and reduce his standard of living.

'Malnutrition and disease! Is that the heritage we will hand those babes of ours? The sword of Damocles in

the form of the greatest continuous tax burden ever recorded in history; that's something for our youth to look forward to!'

Professor: 'But we *must* pay taxes and buy Bonds to help win the war!'

Thompson: 'Yes, in a Price System we must, but if we install Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None, the existing debt can be frozen as it stands, thus eliminating the taxes of this generation. By preventing any further debt creation, America will emerge free of a new war debt and of war taxation when the war is over. Then we can look forward to the arrival of the fittest of Americans yet unborn, instead of the pitiful survival of human beings chained to debt and chaos.'

Professor: 'How can this be accomplished?'

Thompson: 'We, the people of America, may exercise our prerogative as citizens in bringing the program of Total Conscription before our Government. It can be instituted constitutionally by the duly elected Congress, transmitting the required authority to the Commander-in-Chief of the nation, our President. Total Conscription can be installed under the provisions of the Constitution and the laws of the land.

'Total Conscription is an all-inclusive design, which will win this war in the most efficient manner, with the least spilling of blood, with a minimum wastage of natural resources, and in the shortest possible time.



'Allow me to present you with this leaflet, Professor, containing the program of Total Conscription.'

Professor: 'Thank you, indeed, Thompson. I shall read it to my colleagues and I'm sure they will be very

enthusiastic about it. Class dismissed.'

P.S. As a result of his report and reading of the leaflet to the faculty, the professor in Botany was warned to stick to his subject, and Thompson was expelled from the university.

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### Abundance in Opinions

'LIBERAL is a word which has acquired many meanings. In the best sense of the word, a liberal is one who believes that human affairs can be controlled by enlightened reason; *that truth is born out of discussion*; that civil liberties are vital to democracy; that there is no justice where there is no kindness, and that the great ends of human life cannot be achieved except by appropriate means.'—Norman Thomas in *The Progressive* 2/14/44, (*italics ours*).

If you wish to check up on the pathology in the above statement by Mr. Thomas read 'The Logic of Modern Physics' by P. W. Bridgman; 'The Tyranny of Words' by Stuart Chase; and 'Language in Action' by S. I. Hayakawa. A liberal is 'shell shocked' by modern civilization. His is a typical neurosis of the Power Age. He is neither a mug nor a wump, that is he is neither for nor against. He is not consistent or inconsistent. He is neither fish, flesh nor fowl but simply a poorly informed and badly maladjusted citizen suffering from a bleeding heart and a confused set of abstract mental symbols.

Something new was added to America's forensic life last Saturday night, when a speaker at the Montparnasse Forum staged a debate with himself. For the first half-hour, he argued 'pro' the topic, then paused for a glass of water and applause, resuming the second half-hour with a violent attack upon his previous views.—From Sydney J. Harris' column in *Chicago Daily News*, March 2, 1944.

To this we can only add what Oliver Wendell Holmes wrote in his book *The Autocrat of the Breakfast Table*, regarding what he called 'the hydrostatic paradox of controversy.'

Don't you know what that means? Well I'll tell you. You know that if you had a bent tube, one arm of which was of the size of a pipe stem, and the other big enough to hold the ocean, water would stand at the same height in one as in the other. Controversy equalizes fools and wise men in the same way—and the fools know it.

Maybe that's why forums are popular.

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One of the newest Diesel engines weighs only 1.8 pounds per horsepower.

# 'Free Enterprise' or 'Free Technology'

Diagnosis and Prognosis

by The Peripatetic Technocrat

## DIAGNOSIS

### 'Free Enterprise' Means:

*Freedom* to conduct a system of trade and commerce designed solely for the exchange of commodities, on the basis of scarcity determined values for a profit; without regard to distribution;

*Freedom* to exploit the natural resources of this Continent and its public collectively for all the private profit the traffic will bear;

*Freedom* to permit America's No. 1 natural resource, the land, to be eroded and lost in the oceans by unscientific agricultural practices, under-reforestation and over-logging;

*Freedom* for all minority pressure groups to wage political and economic conflicts for preferential advantages at the cost of other minority groups and the general welfare of the whole;

*Freedom* to maintain monopoly controls in order to hold up prices and enforce scarcity on the great majority;

*Freedom* to bury patents, inventions and processes so that industry will not become too efficient;

*Freedom* to permit criminal waste in industrial and agricultural operations in order to increase profits;

*Freedom* to manufacture shoddy goods so they will wear out faster and have to be replaced oftener;

*Freedom* to permit special privileges to the favored few, while enforcing social regimentation upon the great majority;

*Freedom* to oppose every governmental measure intended to enlarge the common welfare, which might restrict special privilege;

*Freedom* to control the press by means of high capital investment barriers, plus fat advertising fees;

*Freedom* to poison the wellsprings of public information by suppressing and distorting the real news and emphasizing transitory and superficial happenings;

*Freedom* to carry on a conspiracy of silence against the design of a scientific social system that can produce and distribute abundance and security to all citizens and provide maximum defense for this Continent;

*Freedom* to control people's thoughts and condition their actions toward conformity with Price System interests by concealed propaganda called 'advertising';

*Freedom* to permit a host of secondary social problems to run rampant because of unwillingness to solve the primary social problem from which they arise;

*Freedom* to pull the strings behind mock political contests carried out periodically on 48 different fronts under that beautiful illusion called the



'two party system,' 'Let not thy left hand know what thy right hand doeth';

*Freedom* to carry on business as usual and exact a greater profit than usual while the country is at war;

*Freedom* to make cartel agreements with enemy nations even though such agreements endanger the security of the homeland;

*Freedom* for some Americans to get rich on war wages, war profits and war racketeering while other Americans spill their blood in defense of their common country;

*Freedom* for business to scheme and maneuver for favorable postwar positions while the war is still going on;

*Freedom* to wage total, technological war with inefficient, expensive Price System methods entailing a

high cost in lives and natural resources;

*Freedom* to agitate for the nullification of the basic law of the land in order to permit enactment of class legislation designed to conscript men and women alone into involuntary servitude to private masters;

*Freedom* to exempt wealth and privilege from effort and sacrifice on the home front proportional to that undergone by the Armed Forces abroad;

*Freedom* to create ever higher mountains of public debt for the sole purpose of maintaining a system of private profit and privilege; and

*Freedom* to propagate the appalling, asinine impertinence that 'FREE ENTERPRISE' means anything else except the clauses contained in this analysis.

## PROGNOSIS

### *Free Technology Means:*

*Freedom* to realign the social structure in conformity with physical laws, so that the industrial system will be geared to abundance and distribution on the basis of physical costs of production;

*Freedom* to guarantee economic security to all citizens from birth to death as a right of citizenship;

*Freedom* to conserve the natural resources of this Continent and advance the general welfare of its people collectively by all the means that science knows;

*Freedom* to protect and enhance America's No. 1 resource, the land, by engineering with nature so as to restore dynamic equilibrium between croplands, forests, water flow and the underground water table;

*Freedom* to construct an all-Continental inland waterways system for low-cost transportation of bulk freight; and to build thousands of earth dams in order to control the run-off of water;

*Freedom* to build an all-Continental system of super-highways for rapid and safe transportation;

*Freedom* to modernize and re-gauge America's railroads to a width more compatible with their function than the traditional 'standard gauge' of 4 feet 8½ inches, copied from the oxcart;

*Freedom* to construct an all-Continental integrated system of power dams, in order to take full advantage of America's great potential hydro-electric possibilities and save its non-replaceable resources of coal and oil as much as possible;

*Freedom* to construct an all-Continental system of long-distance power transmission at exceedingly high voltages and low amperages, so that cheap power can be transmitted from its source to its point of use anywhere in North America;

*Freedom* to construct adequate housing for all citizens which will be designed for the function it is to perform and incorporate the best scientific principles of construction;

*Freedom* for all women (half of America's citizens) from their age-old bondage as chattel slaves of their legal spouses, and placing them on an equal economic and social basis with men;

*Freedom* for all children from the feudal suzerainty of ignorant parents who attempt to restrict them to their own narrow horizons;

*Freedom* from the existence of minority pressure groups by raising the general welfare of all citizens above the point where such social phenomena generate;

*Freedom* for all citizens to have access to equal opportunity in the

social order, regardless of race, religion or color;

*Freedom* to set up an educational system accessible to and compulsory for all citizens wherein everyone may acquire as complete and thorough an education as it is possible for him to absorb;

*Freedom* to set up a public health system, utilizing every scientific modality known, compulsory and free to all citizens, wherein, periodically, every citizen may have a complete physical check-up, and treatment when necessary, so that every one can be as healthy in 'mind' and body as it is possible to be;

*Freedom* to conduct all industrial and agricultural operations on technological principles, in order to keep physical costs as low as possible, increase efficiency to the highest degree and eliminate as much toil as possible;

*Freedom* to install a balanced load system of production and distribution to eliminate peak loads in traffic, recreation and shopping;

*Freedom* to install an all-Continental physical cost accounting system so that it will be known at all times what is being produced and consumed;

*Freedom* to resurrect all buried patents, inventions and processes and put them to work so that industry will reach its peak of efficiency;

*Freedom* to abolish all forms of waste in industrial and agricultural operations, in order to lower the costs of production and conserve natural resources;



*Freedom* to abolish the waste of human talent and ability by opening all avenues for its expression;

*Freedom* to technofacture superior goods, so they will last as long as possible and not have to be replaced often;

*Freedom* to abolish special privileges to a favored few by creating a setup wherein voluntary acceptance of scientific controls will be acceptable to all;

*Freedom* for each individual to be rewarded with social prestige and position commensurate with his social accomplishments;

*Freedom* to keep the wellsprings of public information untrammelled and uncontaminated, so that all citizens will be aware at all times of the occurrence and meaning of physical events and trends in all parts of America and the world;

*Freedom* to provide the best research and laboratory facilities to all citizens, wherein all ideas may be worked out, tested and translated into practical designs;

*Freedom* for all Americans to participate equally in national service in time of war, unrestricted by economic pressures so that no citizens can get richer in any way while blood is being spilled in defense of the country;

*Freedom* for all citizens to be guaranteed favorable postwar positions by guaranteeing the postwar position of America as a whole;

*Freedom* to wage total, technological war with total, technological methods, ensuring a low cost in lives and natural resources;

*Freedom* to build thousands of

Flying Wing super-bombers with which to blast America's fascist enemies, from American bases;

*Freedom* to enact a new contract of citizenship as the basic law of the land, wherein class favoritism will be outlawed and servitude to private masters made impossible;

*Freedom* to underwrite and guarantee the potentially great concepts of freedom of speech, freedom of religion, freedom from fear and freedom from want so that they can at last emerge from their Price System chrysalis into actual existence in daily life;

*Freedom* to eliminate public and private debt by using a medium of distribution which makes the creation of debt impossible;

*Freedom* to provide the maximum defense for this Continent by building up its military, naval, aerial and coast defenses to unsurpassed strength and organizing them along technological lines according to their respective functions;

*Freedom* to liquidate pro-fascism at home as being Continental treason and contrary to the future destiny of America as a whole; and

*Freedom* to install Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None, in order to defeat America's fascist enemies abroad at the lowest cost in lives and resources, avert the perilous postwar period ahead, and provide a peaceful emergency transitional device to reach the greater destiny of America, just beyond the horizon.

# Three Musketeers of America

War Gives Them New Technology

by R. F. Novalis

## Canada-Mexico-U.S.A.

**T**HE three great national entities of the North American Continent can be rated roughly three ways, on the basis of area, population, and industrial output. In each respect they differ.

In numbers of human beings, the United States is first, but it is not generally realized that Mexico is second, with almost twice as much population as Canada. Industrially, of course, the U.S.A. leads, with Canada second and Mexico third. In size, Canada is greater than the U.S.A., with Mexico nearly as large as the difference between the first two. You may look up the actual figures; it is the ratio we point out.

Canada's and Mexico's area have not changed as a result of the war, nor have their populations altered. Industrially both have received a historic technological impetus due to this technological war, and the strange thing, strange except to Technocrats, is that the United States is actively helping out in this expansion, with engineers, with machinery, power and transportation, besides the military. To be sure, in none of these is the inter-operation as large as it could be were the interference-lines and dollar signs not in the way.

Despite them, however, the change is something worth recording as a trend predicted by Technocracy for more than a decade.

Mexico, even with Brazil's new 330,000 ton Volta Redonda plant, remains the largest steel making country in the hemisphere outside of Canada and the U.S.A. Its capacity this year is 600,000 tons. The Mexican pig iron capacity is 440,000 tons a year. (For comparison, U.S. steel capacity is 92 million tons a year, and Canada's  $3\frac{1}{4}$  million tons.)

The latest available data, not heretofore added together, on electric power capacity (not output) for the North American Continental area places Mexico in third place, thus:

U.S.A. ....	50,000,000	kilowatts
Canada .....	10,000,000	"
Mexico .....	680,000	"
Central America	215,380	"
Guianas, Venezuela, Columbia.	65,300	"
	61,060,680	"

In oil refining, the same ratio is found, with the United States' capacity nearly 5,000,000 barrels per day to Mexico's 103,000.

Shades of Maximilian, a 100-octane gasoline plant is being built in Mexico, by the government.

A count was made last year during



a four month period, and it was found that 159 new industrial organizations were registered with Mexican officials. They included 13 metal producing firms, 15 metal processors, 20 food manufacturers, 18 textile mills, 18 sawmills and other industries, including tile, glass and insulating material.

As for that invisible interference line, the requirements of technology are hammering it down more quickly than ever before. Mexico is shipping between 10 and 15 million barrels of oil annually to this country to help out with our shortages. We are using a minimum of 525,000 tons of Mexican copper, lead and zinc yearly, which Pedro mines but could not use at present.

Late in 1942 a bridge was completed across the Suchiate River at Mexico's southern border, tying Guatemala and El Salvador railroads to Mexican, U. S. and Canadian tracks. The time-technology strategy involved in this is noted in a press dispatch, which stated the link 'opened an all-rail, submarine-proof route between Central America's rubber, sugar, coffee, bananas, and other tropical products *within four days of the United States border.*'

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'Canada recently took a step toward closed Hemisphere ties when Prime Minister Mackenzie King declared against greater unity with the British Commonwealth. Economically, Canada is so close to the U. S., and, through a growing chain of legations and trade delegations, to Latin America, that it needs a wider market than the British Empire to maintain

A total of 65,500 Mexican farm workers crossed the border last year to help in our food growing problem. In this connection, *Modern Industry* magazine, referring to native Mexicans in their own capital city, states that 'workers who speak English command higher pay.' And why not?

The productivity of U. S. textile workers is 250 percent greater than that of Mexican workers (55 percent of the population south of the border is still illiterate); only 7 percent of Mexico's homes have piped water and sewage service; 660 of Mexico's National Railway locomotives are between 25 and 60 years old which means that a daily average of over 175 are in the repair shop (compared to the U. S. average of ?? percent). Such are some of the highlights of the need Mexico has for technology.

Even the land has troubles with its prevailing Price System. One small but not insignificant example, noted by *Modern Industry*, was when 'In four days of September . . . the price of tomatoes in Mexico City doubled.'

Next issue Canada's new technology will be outlined similarly.

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full output in the post-war period.'—  
U. S. News 2/18/44

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The Westinghouse Co. has a machine designed by Dr. Earl A. Gulbransen which will weigh oxide films or rust to the degree of a single layer of atoms, weighing about 15 billionths of an ounce.

# From The Camera's Eyevue

## The Old Civilization vs The New

### What Price Opinion?

If you ask the average man to point out the difference between mankind's way of living 7000 years ago and today he is likely to snort: 'They weren't civilized 7000 years ago.' If you ask him what he means by civilized he's almost sure to say: 'Any "dope" knows that.' If you demand a better definition he'll refer you to the dictionary. That ends it as far as he is concerned.

Nevertheless, dictionary definitions are, like all other definitions, simply arbitrary agreements among men. They often serve to conceal lack of understanding by offering verbal substitutes for other terms. Webster tells us that to 'civilize' means to 'reclaim from savagery; educate; refine; humanize.' Civilization is defined as the 'relative advancement of culture' in respect to these ideas. By a little digging beneath the surface we find that all this means precisely nothing, since there are no absolute standards of education, refinement or humanity, as yet.

So we begin our quest for the difference between mankind's way of living 7000 years ago and today from the happy hunting grounds of opinion, where one man's ideas can grow as tall as another's and there is room for all. However, if we stay in these lush fields we'll never get anywhere with our query. The climate of opinion is too agreeable to the ego. So, let's venture forth to the dry land of facts. Precise knowledge, like the shamrock of Ireland, grows nowhere else.

Civilization is not a collection of sentiments or an ideology. It's a way of living. Basically, it is the means whereby men get their living from their environment: plus the institutions which have developed to regulate their co-habitation. This definition is not a verbal substitute for another word but an explanation in terms of physical and social meaning. It is also a fact, since it is the close agreement of a series of observations of the same phenomenon. Anyone who cares to make a study can check up on it.

### 7000 Years Ago And Today

From remote antiquity down to about 200 years ago the means whereby men got their living from their environment changed but little. The chief source of power available with which to do work was the human body. Consequently, no more could be produced than was possible with the total energy of the working population. The domestication of plants and animals extended man's control over his environment. But, by and large, that control was meager for thousands of years. It was a hand to mouth existence for the great majority; with special privileges for the favored few. Civilization became stabilized at a low order of magnitude of operations, in a state of ever present natural scarcity. This socially static state endured until the 18th Century. During this long period the institutions developed to regulate society became fixed and frozen in folklore and tradition.

To be sure there were changes in political states, in philosophic and moral concepts and in titles to the means of production, from time to time. But these changes were superficial involving only changes in systems of thought and not in the fundamental means whereby men lived. The order of magnitude of operations remained the same. Whether mankind made any progress in education, refinement or humanity during the Age of Scarcity is a moot question.

Science and its stalwart son technology are reshaping civilization. They are literally creating a new culture within the shell of the old. The old civilization of toil and scarcity is passing away before our very eyes. With it will go all the value prestige and phony orchids of culture that sprang from its dung heaps of scarcity. The new culture of the Power Age is coming in, impelled by the resistless processes of technology. With it will come abundance and equal opportunity for all. Then technology will be released from the control of Price System interference and obscurantism. It will be set free to perform its prodigies in that 'new world acoming.' And its greatest prodigy of all will be the inevitable demonstration that freedom of technology is the foundation of all other freedoms.





Wide World Photo

laying a pipe line to carry the oil of Iraq to ports on the Mediterranean. The source of power used here is human labor. There are about 24 men at work on this job, totalling a little more than two horsepower of energy. Notice the small pipe, the shallow trench, the hand tools and the obvious air of human toil. The low order of magnitude of operations shown here is normal to most of the world outside America. The problems involved here can be solved with a 'Heave Ho!' and a couple of grunts.



Photo: Courtesy Caterpillar Tractor Co.

In this scene there are only half as many men but a lot of machinery. The prime movers shown total hundreds of horsepower of energy. The ditch is wider and deeper than in the first picture; and the pipe is twice as large. Notice the tractor driver taking it easy and the general absence of human toil. Yet here is a dynamic scene depicting a high order of magnitude of operations; power, speed, efficiency. Problems here can only be solved by following the design of the job and the mechanisms employed.



Photo: Courtesy A.T. & T.

In the next two pictures we again look at the old vs the new way of doing things. Here is an outside plant lineman battling the weather to keep the wires open. Floods, fires and Winter storms are a constant menace to overhead telephone communication. These conditions made preparedness a habit in the Bell system. Men like the one shown and the engineers behind them have done a functional job in their industrial sequence of operations. Communication is a vital artery of social life.





Photo: Courtesy A. T. & T. Co.

But, here comes the new way of doing a functional job in the communication field. This is a plow-train burying the new 1600 mile long telephone cable which reaches from Omaha, Nebraska to Sacramento, California. This link completes all-cable telephone facilities from coast to coast. Neither snow, ice, sleet or flood can cause the dire message to go out: 'The wires are down between here and —.' The wires are buried safe in mother earth. We wonder what the outside plant lineman is doing now?



Photo: Courtesy Bethlehem Steel Co.

There is something else new in America. As technological methods become more complex it will become necessary to enroll more and more Americans into the orbit of technology. These untrained people, negroes and whites without discrimination, are being taught the fundamental physical principles of industry. It is a class in electricity. Once conditioned to the scientific approach to industrial problems it won't be quite so far to the idea that social problems also are amenable to the methods of science.



Photo: Courtesy General Motors Corporation

This huge multiple tool drills hundreds of holes simultaneously in the heavy armor plate of war tank transmissions. Absolute precision prevails here. Every hole **MUST** be in the right place. It's amazing how quickly these hundreds of holes are drilled, once the job is all set to go. Think, how long and arduous this task would be if each hole had to be drilled separately, by hand. Operations like this can't be done by guess and by gosh. They must conform to the technological principles involved.



Official OWI Photo by Holl

Here is a new industry for war. Fitting and painting 36 foot wooden ramp boats at a southern shipyard. These carriers are built of prefabricated sections. The completed boats are launched by a crane. They are used for making beach landings of men and equipment. Amphibious warfare in the Pacific, with its island hopping and by-passing, requires equipment never made before. Necessities of the job dictate the material needed. Modern wars are waged with the tools of technology.





Official U. S. Navy Photo

Part of the joint U. S. Canadian force which attacked Kiska in overwhelming strength. At the time it was not known that the Japs had already evacuated the island. Landing barges travel in pairs so that in the event of mishap one can rescue the men aboard the other. Landing on a hostile beach is one of the most hazardous military assignments. Barges and men are perfect targets for enemy fire from the shore. Yet it is the best method of attack possible under Price System methods of waging war.



Official U. S. Navy Photo

A landing party hits the beach. Soldiers stride off the barge onto the rocky shores of Kiska island. Carrying full packs they are prepared to make the beach head secure. The best equipment the Price System can furnish is not good enough for these men. Every island between here and Tokio which has to be taken should first be blasted to hell by squadrons of Flying Wing bombers, each Wing carrying 50 tons of bombs. Why not set technology free and wage war at the lowest cost?



Official Photo U. S. Air Force

Icarus flew too near the Sun, the wax of his wings melted and he was drowned in the sea. So goes the Greek myth. Not so with these B-17 bombers of the U. S. Army's 8th Air Force. Caught in the rays of the sub-stratosphere sun more than 16,000 feet above the North Sea the camera transfixed them on film. The weird cloud formation shown beneath seems like the frozen surface of a dead world. The Flying Fortress is a good plane, but the Flying Wing will fly 5 times as far and carry 5 times more bombs.



U. S. Army Signal Corps Photo

In the steaming jungles of the tropics; on the broad expanse of the Pacific; in Europe; and in the bleak Arctic American soldiers carry the colorful symbol of their motherland. In the midst of a driving snowstorm in Iceland the Stars and Stripes waves in blending harmony with the slanting storm. Sergt. Lewis H. Zerl stands in front of the color guard to receive the Legion of Merit Medal from Lieut. Gen. William S. Keating, Commanding General, U. S. Army Forces in Iceland.





Photo: Courtesy Look Magazine

There is another part of our land still in the making. Young America salutes the flag. This is the traditional American salute. It was used on this Continent by the Indians before the white men arrived. History shows no trace of it in the old world. Technocracy Inc. was the first organization to initiate and carry on a campaign against the outstretched right arm fascist-type salute which had been introduced into American schools by native fascists. Fascism is contrary to the destiny of America.



Techphoto by ACS R.D. 814

No picture story of the old and the new in America would be complete unless it showed some of the activities of Technocracy Sections. Here is a lineup of Technocracy Gray cars at Cleveland, Ohio. Technocracy is the only social movement on this continent that predicts the form of the New America to come, from the facts presently at hand. At the same time Technocracy portends disaster for this Continent unless these facts are recognized. Impending social change parades its causes before.



Techphoto by R.D. 12353

Like a wild fire on her vast prairies Technocracy is spreading across western Canada. Here is a Sunday afternoon Study Class at Edmonton, Alberta. This class is operated specifically for service men and increasing in size each week. The Edmonton Section operates 10 Study Classes, 2 being held in the morning hours to accommodate swing shift workers. Literature is available at the Y. M. C. A., the Red Cross Library and the Navy-Army-Wings Club. Technocracy is an all-Continental, American movement.



# Case of the Disinherited Farmer

Soil, Science and Society

by Pvt. Arland R. Meade

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'Agricultural economics is, in effect, the study of how to make farm products scarce, just as ordinary economics is the study of how to keep everything else scarce.' Agro-technology is not interested in scarcity but in applying science and technological methods to agriculture so as to produce more on less land with less labor.

The two following articles are related to each other. The first one shows the trend in agriculture as it is developing today. The second was written five years ago. It is interesting to note how the earlier statements are working out. There's no doubt about it—John Farmer has a tough row to hoe if he tries to resist modern technological methods down on the farm.

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## *Wouldn't Grandfather Be Surprised?*

THE size of American stomachs is little, if any, different from those of 35 years ago. American malnutrition is more a problem of selection and procurement of desirable foods than a lack of volume itself. The American adult seldom consumes more than 1500 pounds of food per year. (Prairie Farmer, January 1941.) In spite of the present booming-births war period, the general rate of population increase is losing momentum, and a relatively static population is North America's most probable state for the near future.

So what?

So the market for agricultural products as food is quite inelastic; we might get by on a little less, and we will never eat a great deal more. For the predictable future there is no likelihood of an appreciable increase

in market for products of the farm.

Is that significant? It is, when the following facts are known and understood.

Between 1909 and 1942, farm production increased 54 percent and output per worker increased 80 percent. During the same period farm employment dropped 15 percent. (*Productivity in Agriculture*, U. S. Department of Labor, November 1943.)

It is very significant that 37 percent of the increase in output per worker came in only the latter 7 years, and the remaining 43 percent in the previous 28 years. The efficiency of output, in brief, increased almost as much in the last 7 years as in the previous 28. This acceleration of efficiency is continuing at the same time the rate of population increase is falling off.

One need not draw conclusions wholly from general statistics, how-

ever, conclusive though they are. A 'field trip' to witness specific examples of what goes into these statistics is revealing.

*Exhibit A:* Al Jongeneel in the Sacramento Valley of California used his own ingenuity, plus scrap metal, and made 'Jongeneel's Beet Jalopy' which does the work of 10 men in digging, topping and loading. Other farm-machinery 'Handy Andies' have made similar equipment, which has proved so effective that the United States Sugar Beet Association, farm machinery manufacturers, and agricultural colleges are cooperating in research to further mechanize the American sugar beet industry to make it more efficient. Obviously, it will not be made more efficient by using more bent-back laborers, but by using fewer.

*Exhibit B:* Broilers were formerly a poultry sideline. Now broilers are grown as a principal industry and by factory methods. For instance, from the Delmarva Peninsula—a finger of land made up of bits of Delaware, Maryland and Virginia—come some 20,000,000 broilers every 14 weeks—and not a chicken farm or a loose feather in sight. The largest broiler producer in the region sends 1,000,000 birds to market annually. Something to crow about?

*Exhibit C:* In spite of the withdrawal of the ablest physical beings from the farms for military duty, 1943 saw the greatest volume of food production of all time in America—more production with less human labor. (U.S.D.A. as reported by AP)

*Exhibit D:* Mr. U. F. Leubben of

Omaha, Nebraska, has invented a rotary hay baler that makes a heavy job for several men into a one-man-plus-machine job. His machine scoops the hay from the ground, rolls it into a cylindrical bale, ties it and throws it out—all automatically. Compare this to hand methods. Technologically, haying has been 50 years behind the times. (*Mechanix Illustrated*, February 1944)

*Exhibit E:* An Associated Press release stated that West Virginia dairy-men were rapidly installing milking machines to take the places of men gone to war. West Virginia is not a major dairy state, but that the same trend prevails all over the country is proved by the wartime increase in milk production in spite of a decrease in manpower. It is reported as 11.7 percent higher in 1942 than in 1939, and still going higher.

*Exhibit F:* At the Clowes Dairy near Stockton, California, one man handles the milking of 210 cows (few farmers milk more than 10 cows per day by hand per man, and the average is still much lower in hand-milked herds). Three other men are used in washing and other preparatory work for the milking. Therefore, with this flowline system, each man is at least 500 percent more efficient than the best of hand milkers. (Information from G. E. Gordon, University of California Dairy Specialist, in *Country Gentleman*, September, 1943.) So-o Boss!

Farming today is falling into line with our scientific age. It can do nothing else.



## *To Produce More, Farm Less*

Hand in hand with mechanization and increased use of power is scientific development of the biological aspects of agricultural crops. Consider corn, that basic and indigenous American crop. Corn has responded abundantly to the process of hybridization. Hybrid corn produces up to 35 percent more grain per acre than the standard 'pure' strains. The production of hybrid seed corn requires specialized seed farms to produce the seed each year, for seed saved from a hybrid crop will not repeat the high production.

Hybrid corn will produce all our requirements with fewer acres and, therefore, with many fewer hours of labor and less destruction of our soil. In addition, the specialized nature of hybrid seed-corn growing tends to bring more specialization and greater need for over-all cooperation in corn growing, putting old man 'Rugged Individualism' down for another count.

The U.S.D.A. reported late in 1943 that hybrid corn occupied 52 percent of our land. That is a big start but there is still as far to go. Improved soil culture, fertilizer utilization, erosion control and so on are all coming into the picture to make more production on fewer acres.

Recently, plant breeders of the Bureau of Plant Industry, Soils, and Agricultural Engineering in cooperation with state experiment stations have developed 'Hybrid 13.' 'Hybrid

13' has unusually strong anchor roots, and is reasonably resistant to leaf blights, to stalk and root rots and to lodging. The work goes on; research is dynamic.

The biologists know they are in a world of machines. More than 25 years ago the U. S. Department of Agriculture and several Great Plains state experiment stations started developing types of grain sorghums adapted to cutting with the combine harvester. In 1943 more than 3,000,000 acres of machine-type, disease-resistant grain sorghums were grown. Agricultural science is on its way to eliminate man-hours at the same time it produces an abundance on a greatly restricted area.

There are great long-range advantages in the fact that we can cut our crop acreage and still eat abundantly. The further development of agricultural science, along with scientific Continental planning in industry, transportation, urban location and other factors important to the way of living in North America, will permit us to produce our needs on the most suitable land only, leaving the rest for reforestation, vast Continental playgrounds or for other purposes advantageous to the people of North America.

Scientific developments help reduce crop acreage indirectly by cutting down losses of produce already grown. Harvesting and shipping are improved by knowledge sent from Uncle Sam's 300 weather stations.

A scientific coordination of forecasts on weather, other harvest conditions, shipping conditions, con-

sumption needs at specific times and places and other factors makes possible the distribution of foodstuffs at peak efficiency, with the minimum of wastage of course.

There is rudimentary coordination now, and when we follow the trend to its conclusion in a real job of all-American coordination, the savings will cut the use of man-hours all the way from the farm to the city home. New war-developed processes of dehydration and compression will cut handling, hauling and storage expenditures still further.

Whichever way we turn, we find the same relentless struggle going on between the inefficient old-habit methods and the efficient methods of machinery and extraneous energy. The victory is 'in the bag' for extraneous energy, and a machine using some of that energy made the bag.

The U.S.D.A. announces that food production in 1943 was 131 percent of the 4-year period from 1935 to 1939—all this with a reduction of manpower and while still far, far short of possible scientific development. The potential of America for real abundance can readily be seen as soon as we let science take the load from bended backs.

Scientific planning on an all-out Continental basis can bring about a level of living in North America that will make pikers of all past Utopian dreamers.

### *Like Driving With the Brakes On*

But there is an interference control acting to prevent abundance for America: the stifling control by Price

System methods. The rules of the Price system are so deeply fixed in the brains of prominent Americans that even at the same time that they see this potential abundance they still maintain a belief that this Price System interference is a necessary evil—yes, sometimes prominent Americans even admit the crippling disadvantages of the Price System.

Mordecai Ezekiel, Economic Adviser to the Secretary of Agriculture stated: 'Besides the enormous quantities of munitions and food going overseas, we are also producing more clothing, books, and food for home consumption than before the war. . . . Farmers are concerned with what will happen to their markets after the war spending begins to decline. . . . If heavy unemployment comes to city workers, there just is no way farmers can be prosperous. . . .' (U.S.D.A. *Clip Sheet*, February 6, 1944)

Note those last few words, ' . . . there just is no way farmers can be prosperous.' This doleful and defeatist statement is based on a knowledge of that interference mechanism known as money. It is the economic interpretation.

Will the American people, facing abundance beyond their dreams, with plenty of leisure time for its enjoyment, let the manipulations of the Price System force them back into breadlines and a WPA?

When in a land of abundance the best in 'Economic brains' says, 'There is no way,' the best of such brains are no damned good for America. Then it is time we replaced them with the brains of technologists and



scientists—and time that we replaced the strangling mechanism of the Price System with a system based on scien-

tific methods that will permit America to reach its natural destiny of abundance, health and peace.

## 'Reshaping Agriculture'

by O. W. Willcox, Ph.D.

Reviewed by W. D. Ellwyn (12349-1)

Reprinted from *Technocracy Digest*, Vancouver, B. C. — April, 1939

'RESHAPING AGRICULTURE' is listed as reference material in the Technocracy Study Course, and like all factual works, strongly supports the findings of Technocracy's analysis of our present social order.

In the latter part of the book, however, the author unfortunately departs from the factual, and futilely attempts to outline a social-economic system in which the Price System is retained. The basic weaknesses of the plan are obvious and we recommend only the first six chapters of the book.

Dr. Willcox shows that due to many causes the population of Occidental countries no longer increases at the former rate and that it is reasonable to suppose that the same trend will gradually affect all other countries. We have no assurance of a continuous increase in world requirements of foodstuffs, although many present populations have not enough.

Increased production is no longer due to the opening up of new areas, but instead to the increasing application of more intensive methods. Greater yields, due to scientific agriculture, the combination of fertilizer,

mechanical devices and irrigation, more than make up for the cessation of area expansion. Continued increase in the use of scientific methods will displace millions now on farms, and will replace scarcity with abundance, to exclusion of price, of course.

The best present methods applied to the best land would leave unused four-fifths of our farm lands; and therefore no longer self-supporting four-fifths of our farm population.

A new social order, which the author foresees as overdue, will have to take into consideration modern discoveries with regard to the potentialities of scientific farming. The constant development of new varieties, with greater growing power, or as it is termed, 'quantity of life,' makes possible vastly increased yields from the same soil conditions, with no extra labor cost, except the haulage of the more abundant crop.

The principles that govern the yield of crops are carefully explained, also that most important discovery—the method of determining the maximum productivity of land. The significance of the terms, 'soil-fullness,' 'Baule units,' 'Law of diminishing in-

crements,' 'perultimate yield,' and the 'formula  $318/N$ ' are all shown, as well as the methods by which these factors have been measured and applied. These clearly point out the futility of reducing acreage to limit production, when with known methods more could be grown on one acre than is usually produced on ten. Wheat has been raised under actual field conditions to yield 117 bushels per acre; barley 122; oats 183; potatoes 789; corn 174; and rye 54. Most of these results are far below the possible set by the 'formula  $318/N$ .' Almost all our crop yields average below 10 percent of potential capacities.

The total crop yield of the U.S.A. of the eight major staples could be grown on less land than is now under cultivation in the State of Kansas. Forty million acres could produce that which was grown on 241 million acres in 1930, and less than two million people could do the work now done by nearly eight million. If the trend towards higher production per land-unit and man-unit continues, we must be prepared for further increase in Price System wreckage among farmers.

As an example of what could be done by the use of the most scientific methods, Dr. Willcox shows that the seven million people of New York City could be fed by an area no larger than that of the city itself, and only one person in a thousand would be engaged in the production. An area equal to one-sixth of that now farmed in Illinois could be made to feed the

entire 125 million people in the U.S.A.

The author states: 'We have the mines, the machinery, the land, the agrotypes and the scientific knowledge; we have the technical processes and the man-power for cramming every home full of the comforts and necessities which every human would gradually receive and enjoy, yet the wheels of production run slow. Instead of consuming more, we work less and tighten our belts.'

Another quotation which will win the respect of every Technocrat: 'Instead of waiting for the present edifice to crash down on the heads of the occupants, a great deal of social tribulation might be avoided by proceeding at once to clear the ground and make way for the new agrobiologic age, which brings to mankind no uncertain promise of a vast new endowment of comfort and security. The new agrobiologic age, and our adolescent machine age both carry the same ominous threat of further economic and social disintegration if left in the clutch of laissez-faire, but if duly tamed, the overflowing cumulative treasures of both will lie in our hands.'

This book is full of Technocratic implications and should be read by every Technocrat. Some are inclined to become accustomed to consider technological displacement as something that has to do strictly with mills and factories. But here is another side of the picture, which shows a possible displacement up to 80 percent of those engaged in our greatest field of employment.



# The Turtle Will Catch Up Yet

Technocracy Predictions and Proposals Recently in the News

by Publications Division 8741-1

1.

**PUBLIC** Majority Favors at Least 1 Year of Compulsory Military Training.—Gallup Poll, 11/17/43.

'Draft Youth After War, Plea of Lt. Gen. Drum.'—12/6/43.

'Compulsory military training . . . for all able-bodied males between the ages of 18 and 21 . . . endorsed today by Secretary of Navy Frank Knox.'—1/17/44.

**TECHNOCRACY PROPOSED IN JULY, 1940:** 'The Government of the United States shall immediately institute a three-year compulsory Continental defense Training for both males and females beginning at 18 years of age and terminating at 21.'

2.

Total lend-lease aid through August, 1943, amounted to \$15 $\frac{1}{4}$  billion dollars, since inception of the program in October 1941.

**TECHNOCRACY PROPOSED IN JULY 1940:** 'We, as a nation, should be frank enough to take over the French, British, Dutch, and Danish possessions of North America in payment of their past war debt and for an acknowledged purchase price of 15 billion dollars worth of American . . . munitions of war that would be supplied to them by the productive facilities of this country.'

3.

'Free U.S.-Canada Trade Urged by Ambassador. Hamilton, Ont., Jan. 19, 1944 (UP). The removal of trade barriers between Canada and the U.S. . . . was urged here last night by Ray Atherton, U. S. ambassador to the Dominion.'

**TECHNOCRACY PROPOSED MARCH 18, 1941:** 'Technocracy proposes that the United States and Canada abolish all tariff barriers at their common boundary line.'

4.

'Defoe is now building 1,700-ton Navy destroyer-escort ships—the largest warships ever launched on the Great Lakes. Through its unique 'roll-over' process, Defoe is able to deliver twice the production per man-hour. . . .'—Advertisement of Defoe Shipbuilding Co., 1/23/44.

**TECHNOCRACY PROPOSED IN DECEMBER 1942:** 'Boats Built Upside Down! This is another advanced construction process which was foreseen and urged by Technocracy.'

5.

'34,000-Mile National Road System Asked in Special Presidential Message.'—January 12, 1944.

**TECHNOCRACY PROPOSED IN OCTOBER 1940:** 'Technocracy proposes a Continental highway

system. . . . (Described in engineering and geographical outline in the A-20 issue of *Technocracy* magazine.

6.

Illinois State Bank report, comparing 1933 with 1943:

	1933	1943
Number of		
Banks .....	616	484
Loans .....	\$300,000,000	\$ 295,000,000
Capital		
Structure ...	\$134,000,000	\$ 133,000,000
Deposits .....	\$627,000,000	\$2,000,000,000
Government		
Bonds .....	\$184,000,000	\$1,000,000,000

TECHNOCRACY PREDICTED IN DECEMBER 1938: 'The banks are keeping up the farce of *private* banking. They dare not let the public learn of the actual facts for fear of the loss of public "confidence."

The above figures of the Illinois State Auditor show that the number of banks in business, their total loans and their capital structure have all declined, while deposits, on which they must pay interest, and Government bonds, on which the rate of return is at an all-time low (as a result of credit abundance) are both way above 1933. *The banks are in a much worse condition than in 1933, but only the bankers know it.*

Among the few points brought up in attempted opposition to Technocracy's Total Conscription program is the one that it would vastly expand and complicate the administration of the war and home fronts, especially in Washington.

Apparently Howard Scott's state-

ment in *Technocracy* magazine, A-21 (Nov. 1941) was overlooked:

The present system of contracts, purchases, transportation and invoice payments of our defense program is daily becoming a more hideous mess. . . . Every contractor of army and navy . . . proceeds to purchase on individual *purchase orders* for each specific contract.

Individual corporate purchasing will have to be abolished and substituted (in Total Conscription) by mass government purchasing reduced to the simple formula: that every purchase order is for the 30-day operation-output of mine, factory, or operating unit.

Figures have just been released on the actual number of *purchase orders* with which the Price System's business-as-usual waste of manpower and paper is slowing up only one of our production items—planes. A single four-engine bomber cannot be built under control of private enterprise without 10,000 individual purchase orders. Add to these 10,000 orders, the accompanying bills of lading, invoices, etc. and *multiply by the thousand of these bombers* that our factories turn out a month and you see at once how 'streamlined' 'all-out' and 'efficient' business is in wartime America.

Incidentally, a single fighter plane uses up 3-4,000 of those Price System purchase orders . . . and we produce 8,000 smaller war planes monthly. (Wayne Parrish, *Liberty Magazine*, January 15, 1944.)



Illustrating the difference between the political and the scientific approach to problems Howard Vincent O'Brien in his daily column 'All Things Considered' in the *Chicago Daily News* for July 27, 1943, wrote the following:

'To Mr. Armstrong (Edwin H. Armstrong, inventor of the regenerative circuit, superheterodyne circuit and frequency modulation) I am indebted for another illustration of the difference in approach between the politician and the scientist.

'In the early days of the telephone, when parallel lines were strung too close together, there were induced currents which caused "cross talk."

'The political remedy was simple—pass a law limiting the distance between wires.

The scientist went at the matter differently—and produced the co-axial cable, on which more than 400 simultaneous conversations can be carried.—'

'after citing another example wherein in political attempts were made to solve the interference caused by the spark gap method of ship-to-shore radio transmission which was later eliminated by the radio tube Mr. O'Brien quotes the historian Buckle. 'The best things legislators do is to repeal the laws passed by their predecessors.'

### **Price System Fame**

There was only a line or two in most dailies when Dion Geraldine, a great engineer, died at Detroit during the first week of January 1944.

Geraldine was superintendent of construction at the World Columbian Exposition in Chicago in 1893. He was also one of Chicago's early city engineers and over a long career had many outstanding accomplishments to his credit. One of his assistants during the construction of Chicago's first world fair was named O'Banion. Some years later O'Banion named one of his sons Dion, in honor of his former boss.

During the bootleg era, when Chicago's gang wars made the front page all over the world, Dion O'Banion became a noted figure in the gang

world. He operated from a flower store on the near north side. One day two unknown men walked in and greeted O'Banion effusively. Each of them extended a hand in greeting. O'Banion extended both of his hands. With both of O'Banion's hands thus engaged in friendly clasp, the unknowns proceeded to pump him full of lead.

Dion O'Banion, the noted figure of the underworld, enjoyed a lavish funeral which was attended by city aldermen and everybody who was anybody at the time.

Dion Geraldine, the great engineer, died unheralded except for a few measly lines in a few daily papers of America's 'free press.'

Such is Price System fame!

# A Primer of Technocracy

by Education Division, 8741-1

AMERICA ON THE GO!

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This is the third in a series of articles on some of the elementary principles of Technocracy. The first appeared in the January-February issue and dealt with the fundamental role that energy plays in human life. The second appeared in the March-April issue, and gave a brief review of the period between Columbus' rediscovery of America in 1492 and the beginning of the industrial revolution. Back issues are still available.

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## *When a Snowball Starts Rolling*

FOR three hundred years America had been going through a period of colonization and exploration. When the industrial revolution began in England, America was all ready to go. And, it has been on the go ever since. The opening stage of the industrial revolution began in Europe, but was advanced concurrently in America. The rise of America has been synchronous with the renaissance of scientific knowledge and civilization in the western world and the rise of the industrial revolution.

The first phase of this radical change in the means whereby men lived was characterized by the steam engine, blast furnace, rolling mill, power loom, factory system, iron plow, reaper, seed drill and the cotton gin. These were primary developments. Of all the inventions recorded during this opening period, by far the great majority were developed by amateurs, that is, with

non-laboratory techniques, by non-professional scientists. Science was also in its early stages, and not well-organized as a body of knowledge. This first stage of industrial development continued apace in Europe and America.

Thomas Jefferson said once that it would take a thousand years to settle up the Louisiana Purchase. But America had potentialities undreamed of then and nowhere near realization even today. One invention of the opening of the industrial revolution, which was a forecast of things to come in America, was the development by Eli Whitney in 1798 of machine tools and dies for the manufacture of interchangeable parts in turning out rifles on a Government contract. This gifted and courageous American was the father of mass production, which today is a cornerstone of American civilization.

The American Civil War, which began 84 years after the Liberty Bell rang out, and James Watt introduced



his steam engine, marked the opening of the second phase of the industrial revolution. This began in America. Although still a brand new nation, America was expanding rapidly. This second period was characterized by the extensive building of railroads, the development of telegraph, telephones, turbines, internal combustion motors, vulcanization of rubber, the gang plow, binder, separator, tractor, artificial fertilization, irrigation projects, and the homesteading of the West. Less than 100 years after Jefferson had uttered his erroneous opinion, the entire United States had been settled. This second period was the golden age of the American Price System, for its entrepreneurs at least.

The Western frontier, that great safety valve of the American Price System, was wiped out by 1900, America then moved onward into the third phase of the industrial revolution, while the rest of the world lagged behind in the first and second. This difference in industrial development between America and the rest of the world was determined by the unequal distribution of the world's natural resources. The possession of usable physical wealth is a prerequisite to industrialization, and America has the lion's share of the world's natural wealth. How else could a young, new land forge ahead of more solidly established cultures so rapidly?

### *Enter, the Power Age*

This present stage in America is marked by mass production of interchangeable parts, electrification of in-

dustry, technological processes, automatic mechanisms, and the photoelectric cell, making possible large-scale operations in the development of automobiles, aviation, shipbuilding, radio, television, ferrous and non-ferrous alloys, light metals, plastics, synthetics and war materiel. In addition, there is rural electrification, mechanization of farming, hydroponics and agrobiolgy. Almost 100 percent of all the energy used as power in the American industrial structure is derived from sources outside the human body, such as coal, oil, gas, wind, and falling water. In other words, our entire civilization today and the means whereby we live and produce goods and services is derived directly from, and almost completely dependent upon, the conversion of free, natural energy into power and work; together with the technological methods associated therewith.

Energy and technology are the two ever present and basic factors of social life which can be traced all through the long progression of mankind from its simple beginning to the latest, startling invention of today. The higher development of this trend in America, as compared to the rest of the world, dictates that the age of human toil is past on this Continent. This constitutes the core of the American social problem today.

### *One Way Street*

Although the new world of America had created a new and advanced technological system of production, it re-

tained most of the social institutions and all of the distributive system of its previous age of human toil and scarcity. These institutions, relics of the long age of scarcity, had been imported from Europe and were superimposed upon the underlying system of production of physical wealth in America. Technology and industry, responding to the advance of science, expanded and became more complex from one stage to the next. The social structure, however, remained static. In the adoption of the American constitution, early in the industrial revolution, this social structure became a vested institution.

In the preamble to the Constitution, it states that the document is adopted to accomplish six objectives. These are: Form a more perfect union, establish justice, insure domestic tranquility, provide for the common defense, secure the blessings of liberty, and promote the general welfare. Many articles and sections of the Constitution are devoted to methods of realizing the first five of these objectives. The last and most important one of all, *the general welfare*, is mentioned only once. That is in Article I, Section VIII, and no provisions are made for realizing it. By 'general welfare' we mean mental and physical status as a whole and income of goods and services. This little item has always been considered to

be an incidental by-product of a well-fed and well-protected business system.

The uncontrolled application of scientific knowledge to the means whereby men live has created a profound repercussion upon our superimposed, static social system. There is an irreconcilable conflict of interests involved between an advancing, dynamic science, and the vested interests of static social institutions. America has come a long way since 1776. This was possible because a virgin continental area, rich in resources and stored energy, permitted great expansion. Now, in obedience to the laws of dynamic equilibrium of that continental area, America has reached the peak of its growth curve under the Price System. Where do we go from here?

If we assume that the paramount concern of science and society both is the general welfare of the human components involved, our course becomes clear. America and science both contain a wealth of promise, but so far have yielded little, except a change of taskmasters for the great majority. Consequently, before we can carry our inquiry to its logical conclusion, we must have a closer look at the nature of science and determine how it functions and for whom.

*Next issue: What Is Science?*

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The Army Signal Corps now has a radio weather station about the size of a small trunk that will broadcast reports on temperature, humidity and

barometric pressure every few hours for three months when buried on the shore of an enemy country. *Science Digest* November 1943.



# Technocracy and Your Trade

The Coal Miner

by Organization Division 8741-1

## *How Green Was My Valley*

**I**N 1912 the average American coal miner dug  $2\frac{1}{2}$  tons per 10-hour day, but by 1942, working about 7 hours, he or his son was able to mine 5.2 tons a day. How come? Was the 1942 miner that much stronger? Not if you read the coal trade magazines' ads of loading machines and mechanical cutters and note the capacities proudly proclaimed per hour. Like the nation's railroads, the coal mines reached their all-time employment peak (around 800,000 men) a score of years ago. Yet last year the bituminous mines produced more coal (590 million tons) than any year in U. S. history, with only 415,000 men, 100,000 less than in 1940.

In 1918 a total of 615,000 miners were employed in bituminous mines, and they produced 579 million tons. Last year the 200,000 *fewer miners* dug out just 10 million tons *more* than were mined back in 1918!

Mechanization in the mines was increasing before World War II began. Furthermore, in the past three years purchases of loading machines by the mine managements have increased 300 percent. Will this be used after the war?

Granted that one owner took a million dollars worth of machines out of his West Virginia mines back in the

last depression, what were the rest of them doing? *Buying* more machines.

Here are some interesting highlights from the history of American coal mining technology:

In 1890 only 4 percent of bituminous coal was *cut* by machines; by 1940 the percentage had increased to over 90 percent.

Machine *loading* was not introduced until just before 1925, and the coal loaded into underground trucks by these machines amounted to only 2 percent that year. In 1940, a comparatively short time of only 15 years, this had increased to 25 percent. Last year it jumped to 42 percent. Here's a good example of what technology does to man-hours, for in 1940 there were only 440,000 coal miners on the job, to mine nearly 460 million tons.

In 1937, F. G. Tryon, well-known coal statistician, stated that: 'At a wage rate of 80 cents an hour, savings with the large mobile (loading) machines that completely eliminate hand shoveling are claimed in the order of 15 to 55 cents a ton.' As coal was then selling at under \$2 a ton at the mine, the advantage, to the mine management, of buying new machines was quite obvious.

It still is. The fastest loading units now on the market have a maximum capacity up to *10 tons per minute*, although the average machine delivers

around 4 tons per minute. Did you ever try shoveling coal?

Back in 1934 only 534 of these machines were in use in American coal mines, but by 1942 a total of 2,315 were installed. Last year 234 more were bought, an increase in one year of more than one-tenth of the equipment in use the year before!

### *Exit—The Mucker*

'For the industry as a whole, the new machinery, therefore, is just getting under way. That it is destined to spread very widely is shown by the fact that in some districts the great bulk of the output is already mechanized. In 1935, 90 percent of the Wyoming production was mechanically loaded, 62 percent of the Indiana production, and 56 percent of the Illinois production.

'Some light on the possible rate of increase (in mechanical loading) is thrown by the past record of the introduction of the cutting machine. . . . The first 10 years of the loading machine have followed a course much like that of its predecessor. It is well to remember, however, that the cutting machine had to make its way in an industry which was just beginning to use electric power. The loading machine enters at a time when primary haulage is already electrified in all but the smaller mines, making the task of bringing power to the face comparatively easy. The loader may therefore spread more rapidly than did the cutter.

'The rate at which the mechanization of loading can go on within a given area depends partly on the wage rate. The districts of the West where mechanical loading has now become general were marked by relatively high wage rates, and conversely the districts where wage rates were low, found little incentive to mechanize. With the recovery in wage rates which began in October 1933, sales of equipment have multiplied and numerous companies in the East and South that formerly saw no advantage in mechanical loading are now installing machinery. In 1936 more machines (were) sold in West Virginia than in any other State.

'Mechanical loading underground has also stimulated changes in the work of preparation on the surface. . . . The tonnage of bituminous mechanically cleaned has increased from 3.8 percent of the total output in 1906 to 12.3 percent in 1935, and further extension is assured. . . .

'The mechanical changes under way in the bituminous coal mines constitute a major technical development. Mechanical cleaning yields a better and more uniform product, mechanical loading reduces the cost.

'The substitution of power for human muscle reaches its maximum in strip or open-cut mining. In limited areas where the coal seam lies close to the surface, the overlying dirt or rock may be removed with power shovels and the coal loaded into cars or trucks, usually with smaller shovels of the same type. The use of open-cut methods is expanding, both in coal and in certain branches



of metal mining. The lines of technical advance have included the application of caterpillar mounts, replacement of steam by electric power, development of machine methods of shifting the tracks on which the coal or ore cars enter and leave the pit, or even elimination of the tracks by use of motor trucks. But the most important change has been the simple evolution in the size, power, and range of the shovel. Capacity of the dipper of the largest shovels has increased from a maximum of about 4 cubic yards in 1914 to 32 cubic yards, and the physical limits have not yet been reached. These enormous machines can handle not only dirt but sometimes beds of limestone and shale and permit the removal of 50 feet of overburden to recover a 5-foot seam of coal.

'The immediate outlook points to further expansion of stripping as opposed to underground mining, though the long-run outlook is for exhaustion of the areas which can be worked by stripping. As the thickness of the overburden to be handled increases, the costs of stripping mount, and ultimately expansion of stripping will be checkmated by the competition of underground methods. . . . The rise of open-cut mining poses an obvious problem of technologic unemployment. Only a half or a third as much labor as in underground mining may be required, and where conditions are especially favorable the method provides the cheapest fuel and metal thus far attained.

'Overshadowing other social effects

is the possible influence upon the mine workers. The short-run effect is to inject an element of technologic unemployment in an industry where other factors have already reduced the number of jobs. The decline of 247,000 in the number of men employed at bituminous coal mines since 1923 is due chiefly to other causes—to the liquidation of surplus capacity created by the war and to changes in demand associated with fuel efficiency, oil and gas competition, and the depression of general business. The best steam-electric plants are generating, at present, a kilowatt-hour on less than 1 pound of coal as compared with an average of  $3\frac{1}{2}$  pounds in 1918, 5 pounds in 1900 and about 10 pounds of coal in 1880.

'The loading machinery likewise affects the kind of worker needed. Certain of the old skills are no longer required though familiarity with the customs and the dangers of life underground remains essential. The machines put a premium on quick reaction time, adaptability, intelligence, mechanical knowledge, and ability to work under supervision. They favor younger men and the prospect of working up to machine jobs tends to attract youths with better education who formerly had no interest in the mines. Older men without machine experience are handicapped and it is possible that the young men now recruited for service with the machines may be superannuated at an earlier age than prevailed under hand loading.' From *National Resources Committee, Tech-*

### *nological Trends and National Policy.*

There are still too many coal miners doing hand labor. But it won't be for long. If you want to be a coal miner, you'd better go over to Europe after

the war. We are going to use technology here. And why not? No human being was ever born for the purpose of digging coal by the sweat of his brow!

### ***There's A Rainy Day Coming***

'The nation looked at this paradox last week: Although the Department of Labor revealed that 1,106,000 fewer persons in the United States were working at non-agricultural jobs during January than a month earlier (37,229,000 in January; 38,335,000 in December), pleas were being made for personnel to man the railroads, to mine coal, and to take on jobs in other specialized fields. The layoff rate was the highest for any month since July 1942, new hiring lowest since 1941. Some sections were crying for additional labor. (Chicago, for example, was classified as an acute labor-shortage area because of a claimed shortage of 47,000 workers.) But other communities were bedeviled by unemployment.

'At least one thing seemed clear enough: Sen. Harry Truman was right when he predicted nearly two months ago that many communities would face increasing labor surpluses. And in his committee's annual report last week Senator Truman said that even more unemployment may be expected. The reason: It will not be long before the volume of war contract cancellations will exceed new orders.' *Newsweek*, March 13, 1944.

In 1939 before the war boom started there was about 8 billion dollars in cash in circulation in the U. S. The increase since that time has been nearly 200 percent. The total now is about 21 billion, an increase of almost 5 billion dollars in the last year.

In 1918 there were 29,000 banks in the U. S. In 1929 their number had declined to 25,500 and by 1943 there were less than 15,000. Here is another case of a rising production curve and a declining man-hours per unit and total man hours curve together with a lesser number of establishments. Can it be that technology is invading the debt certificate racket?

Another feature of this current currency expansion is puzzling. In 1939 the volume of large denomination currency, bills over \$50, was 2 billion dollars. At the end of 1943 it had risen to almost 6 billion. It is reported that about 2 billion dollars of this increase was in \$100 bills. This is a convenient denomination to stick away in a safe deposit box for a rainy day.

Does this hoarding indicate a lack of confidence now; or confidence that there will be a lack in the near future? Will some well informed reader kindly enlighten us? 'Honest Money' fans save your postage stamps.



# Technology Marches On

Smaller and Faster

by Research Division 8741-1

## *He Just Keeps Rolling Along*

THE subtitle of this series has been no more evident in a long time than a new General Electric motor, now being mass produced. The average 3 h.p. electric motor weighs about 105 pounds and turns at 1,800 revolutions per minute. You find them in your washing machine or refrigerator.

Drilling and grinding holes in soft metal with a 1/32-inch drill could not be done with this average electric motor, for *power* is not the only thing that must be considered. Technologists realize that a change in scalar quantities changes the factors of a problem, and when it became necessary to design a power-driven tool capable of precision operations in ultra-small dimensions, they had to change the quantities other than power, such as speed.

The new motor, developing the same amount of power (3 h.p.), delivers for the purpose not 1,800 r.p.m.'s but 120,000 r.p.m.'s. Equally unique is the fact that in order to transmit 3 horsepower at the rate of 2,000 revolutions per *second*, to the tool-driving shaft, the motor *has to be* built smaller than the 3 h.p. motor, such as in the average American household. It weighs only 7 pounds.

The significance of this to America's social and technological problems is that all new machines operate at faster speeds, weigh less, or take up less area. In most cases all three result. In any case the result is greater efficiency. In this the net effect is greater productivity per machine and less factory floor space. These are two of America's basic trends, stepped up by war production, which conflict with the Price System's need for taxes and for purchasing power.

A Detroit plant has installed an automatic inspection machine which examines as many as 17,000 aviation engine castings in 24 hours. The device contains two 12 foot steel towers, containing giant X-ray tubes which are focused on a 40-foot long conveyor. Castings are carried along by the conveyor and given the 'once-over' automatically for cracks and other defects. Each film has a number corresponding to the number on each casting, so that defective parts can be identified immediately. The entire unit can be operated by from one to eight men.

To give you some idea of what aeronautical engineers have been accomplishing—the 2,200 h.p. aircooled Wright Cyclone engine, once rated at 575 h.p., now (1) packs as much power as a good sized freight loco-

tive, yet weighs no more than the iron horse's wheels, takes up less space than there is in the cab; (2) contains a cooling area in its intricately designed fins of nearly 600 sq. ft.—greater than the area of two bowling alleys.' *Modern Industry*, January 15, 1944.

#### *Riveting Machine Will Slaughter Jobs*

'A machine that will drive from 36,000 to 75,000 rivets an hour has been adopted by the Lockheed Aircraft Corporation, at Burbank, Calif., and will be made available to other plants, it was announced this week. Three men in six minutes can do work normally requiring 100-man-hours, officials of Lockheed said.' *Labor: A National Weekly*, February 19, 1944.

#### *Home-made Power Tool Speeds Rib Nut Threading*

'A small power tool built by George Thompson, electrical worker at the Ford Willow Run plant, has made possible a production increase of the order of 8 to 1 in an operation on the leading edge of the B-24 Bomber.

'Attaching of the rubber de-icing boot to the wing's leading edge was formerly a hand operation performed by women—one of the tasks being the threading on of rib nuts. The job was monotonous and slow. The drudgery was taken out of it when Thompson appeared one morning with a small power tool he had built at home. It consisted of a slow-speed reversible motor and shaft, to which was attached a chuck of his own design.

'In using the new "rib nut threader"

device, the worker fits the chuck over the nut and a few turns of the motor drives it into place. Time studies show that three workers, using the power threader, now replace eight women who once occupied the station. Furthermore, these workers turn out almost four times as much work as the eight formerly produced.' *Aero Digest*, Dec. 1943.

#### *Swivel Support for Firewalls Eliminates a Worker*

'A special swivel holder and support attachment for the Taylor-Winfield spot-welding machine has been developed by Charles Wilkinson, a Douglas aircraft employee. Welding of firewalls used to take three people 45 minutes to complete. With this new device, one person does the job in only 15 minutes.

'The support holds a swivel bracket which eliminates the need for one man to hold the firewall while the spot-welder is operating the machine. These firewalls weigh about 35 lbs. each and used to cause the worker considerable fatigue.' *Aero Digest*, Dec. 1943.

#### *230-Hour Job in 32*

'The original daily small output (aircraft engine crankcases) was met with a minimum of tooling and required 230 hours of work, with the spoilage averaging 47.6 percent. An order nearly tripling the daily output mechanized the crankcase operation. Thirty-two new machines were added, along with their jigs and fixtures. Instead of 230 hours of manufacturing time, the work was cut to 125 hours and scrappage reduced to less than 7 percent. Tooling expansion



and refinement kept pace as production schedules were later doubled and then doubled again. Machine time dropped to 40 hours and finally 32 hours.

'Meanwhile, the application of automotive mass production methods caused similar changes throughout the entire engine plant. Two specially designed boring mills were installed to accomplish simultaneously 18 operations formerly done individually. Production was increased 92 percent and total production time for a complete engine was cut in half.' *Chicago Daily News*, Feb. 15, 1944. *Wire Recorder*

'A long shadow of the postwar world slanted across an alumni gathering of the Illinois Institute of Technology yesterday when 27-year-old Marvin Camras demonstrated his wire recorder invention. A hair-thin wire spun between two spools recorded magnetically the hit tunes of "Oklahoma" and reproduced them with remarkable fidelity.

'Wire recorders promise to be a fixture in the home of the not-too-distant future. They can be manufactured at the cost of a portable radio and are about the same size. Every model now produced is immediately employed by U. S. armed forces.

'Camras is now an associate physi-

cist in electricity at the Institute. He was top honor graduate of the school in 1940. Work on the recorder began in 1941 and the machine made its debut last year.' *Chicago Daily News*, Feb. 11, 1944.

### *15 Million Unemployed*

'A drop in national income to 100 billion dollars would add up to unemployment for ten to fifteen million American workers. It would ruin our farmers, throw thousands of business men to the wall and catapult us down a spiral of deflation that would make the crash of 1929 feel soft as a feather-bed.' *United Automobile Worker*, Feb. 15, 1944.

### *60 Percent of Yanks Over 65 Termed Charity Objects*

'Dr. Marjorie Shearon, economic consultant to the Social Security Board, told the special Senate pensions committee today that 60 percent of Americans over 65 years old depend on charity or their relatives for support.

'Appearing in the committee's investigation of pension legislation, Dr. Shearon asserted that the economic status of the nation's elder citizens has "declined appreciably" during the last 10 years. She said that only 40 percent of the elderly people live on their own earnings, savings, pensions or annuities.' *U.P.*, July 14, 1942.

### *Talk Is Cheap*

'Our success in war and peace depends, not on luck, or rhetoric, or the intervention of mythical gods; it depends on human character and

modern scientific creations and on respect for the meaning and methods of science.' Harlow Shapley, *Astronomer Time* 5/24/43.

# In The Question Box

by Public Speakers Division, 8741-1

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**This department consists of actual questions asked and answered at Technocracy meetings, plus those sent in by readers.**

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What would be the solution to our financial problem if we have 30,000,000 unemployed after the war as the speaker implied? E.G.

There just wouldn't be any solution. The United States Government will have to create more debt, that is, it will have to give out more money than it takes in, in order to care for the disemployed. There is no solution to financial problems in a Price System, once it has passed its peak of expansion. It must create ever more and more debt to keep going. That is how we are financing this war; and also how we 'financed' the depression period from 1930 to 1940. There is no limit to the ability to create debt, since it is created out of nothing. However, it can't be paid back in the same coin. The only way the national debt can be paid back under the Price System is for the system to enter another long period of expansion, wherein physical production would increase at a sufficiently greater rate than debt, to permit repayment. It is only in periods of expansion, when jobs are plentiful, that the people are able to carry a continuous tax burden heavy enough to pay back the national debt.

Would *Total Conscription* stop the piling up of our Federal debt? C.B.

Yes! It would be impossible to add another dollar to the national debt from the minute that Total Conscription went into effect. Total Conscription would quick-freeze the entire financial structure as is, and we would begin operating, at once, on a non-price, non-profit basis. The U. S. Government would assume title to all the productive and distributive processes. Since the Government would become the sole source of income and the sole employer for all the people, they would all in effect be working for themselves, and all would have an equal share in the national entity. This would make all the devices of trade and commerce, which depend upon the creation of debt to pay profits and interest, unnecessary. All citizens would be enrolled in National Service and receive the same scale of pay as that which prevails in the Armed Forces. After the war is over, the people could go back to the futile and hopeless process of piling up debt against each other, individually and collectively, if they wished. The major object in view is to win the war at the lowest cost in lives, resources and debt.

How can you say that Germany, a nation long famous for its scientists, operates on a hu-



man toil, hand tool system?  
A.M.

There is no doubt that Germany has produced many leading scientists, especially in the field of chemistry. Nevertheless, Germany, and all of Europe, is poor in natural resources as compared to America. Germany has a mixture of modern technology and handicraft-agrarian methods of production. Germany is smaller than Texas. Yet it has a population of 77 million, on a land area of only 224,973 square miles, or about 340 people to the square mile. There are 3,400,000 farms in Germany of less than 5 acres each. Such a setup can only be operated by human toil and hand tool methods. In the United States, the average farm is about 150 acres and has been growing larger ever since the Civil War. The population per square mile of North America is only 19 and the natural resources are infinitely greater than those of Europe. The state of advancement of the industrial arts is much greater in America. That is why Europe must, and America cannot, operate on the basis of human toil and hand tools.

In Total Conscription, do you include the mothers of young children? A.L.

Yes! Everybody is included in Total Conscription. Maintaining a home and raising children is one of the most fundamental institutions in America. As such, mothers of young children would receive a scale of pay accordingly, which in no case could be less than the pay of a private in the Army, plus food, clothing, hous-

ing and health care, and no deductions for rent, interest, taxes or war bonds. If the mother went to work in a war plant, her child could be taken care of in a modern day nursery under the best of care. Thus, she could assist the war effort without neglecting her children. This would greatly reduce juvenile delinquency.

In Total Conscription would our big pile of gold buried in the Kentucky hills be of any use?  
A.D.

Not enough to get excited about. The main use of gold in the past has been its mythological standing as a foundation for other forms of money. Today, there is still supposed to be some relationship between gold and active money, but it is hard to pin down. The active money of the U. S. now consists of Government paper and bank credits. The United States ceased to coin gold in 1933, and no one may legally possess the metal now except the U. S. Treasury. Metallurgists are hard put to find any industrial use for gold that cannot be performed better by some other metal or alloy. Gold does have some use in electroplating, gilding, jewelry, and dentistry. We might offer solid gold teeth to every Hottentot or solid gold medals to every native fascist as an inducement to get off this Continent.

What would happen to the labor unions in Total Conscription? E.D.

Organized labor would not be abolished in Total Conscription. Its organization structure would remain intact and unaltered, but its custom-

any functions would be frozen for the duration and six months thereafter. Since all national corporate wealth and its attendant institutions, such as banks, trusts, etc., and all industry in toto would also be conscripted and frozen for the duration, organized labor would be in a preferred position in Total Conscription, as compared to its position now. By this we mean that it is in great danger of being abolished at the present time by means of legislation designed to conscript labor alone. This action would make organized labor null and void, deprive it of its hard-won gains and put it at the mercy of corporate enterprise, which would like nothing better than to destroy the unions. Total Conscription would put

labor on the same basis as all other citizens and preserve their organizations until the war and the postwar period is over.

Is not Total Conscription just an opportunist move to try to smuggle in Technocracy by taking advantage of the war? M.S.

No! Technocracy is not an opportunistic body of thought. Besides that, Total Conscription is not Technocracy's social program for America, but a blueprint of operations designed for this war against fascism. The last clause in the Total Conscription program states specifically that its specifications are to 'remain in force not longer than six months after termination of the war.'

### **No Question About This**

'In the past two generations the control of the national system of production and distribution has been taken over by a minute nucleus of owners, the whole enterprise is still undesigned because it is still operated on the principle of laissez-faire. The present extreme concentration of control, therefore, does not carry with it the slightest element of sound design. The old competition of individual entrepreneurs has merely given way to the new mass competition between great corporations and separate national industries. The whole mechanism is still operated for the private gain of three to five percent of the total population.'—Harold Rugg in 'The Great Technology.'

'We dignify by the name "beliefs" a wild jungle of traditions and superstitions.' Paul Gibson, radio commentator, Station WBBM, March 16, 1944.

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Articles by various divisions of 8741-1 are collective compilations.



# Hear Ye! Hear Ye!

## And This Isn't The Half Of It

'It's terrible the way people have gone generally stale on the war. People who haven't relatives in the service don't seem to know a war is on. Popular interest in all the home front activities is lagging—in buying war bonds, in collecting fats and paper, in producing munitions. I can't sleep at nights, thinking of the disinterest.' Mayor Kelly of Chicago, in *Chicago Daily News*, February 4, 1944.

---

Overheard in the lobby of the Chicago Club: a blustering, apoplectic Old Guard Republican member turned to his friend and sputtered, 'By George, if it's Willkie against Roosevelt this year, I'll—well, I'll vote for Norman Thomas and then blow my brains out.' From Sydney J. Harris' column in *Chicago Daily News*, February 10, 1944.

---

'In the absence of such unity of purpose we are today, after more than two years of active war, a group of self-seeking blocs. In the face of the indisputable need for rigid and horizontal economic controls the cry of each economic bloc has been: "Give us one more mite to 'equalize' our relationship with the others, and then put a ceiling on farm prices, or the price of staves, or a limit on war profits, or a limit on wage rates.'"—Edwin A. Lahey in *Chicago Daily News* February 2, 1944.

'I would lay down my life in the fight to keep America free from grade labeling. As a consumer I insist upon the right to depend on the integrity of the men behind the country's trademarks. And if, in the end, I poison myself by eating the wrong kind of food, or cut my throat by using the wrong kind of razor blade, or freeze to death sleeping under the wrong kind of blanket, I shall go to my reward secure in the knowledge that I have lived and died as a free-born American should.'—Congressman Charles A. Halleck of Indiana, Chairman of the Republican National Campaign Committee, before the Cincinnati Advertisers Club recently, as reported by the *Minnesota Union Advocate* and reprinted from *The International Teamster*, March, 1944.

---

'I plead for recognition of the fact that progress in science does not only consist in accumulating information which may be put to practical use, but in developing a spirit of prevision, in taking thought for the morrow; in attempting to forecast the future, not by vague surmise but by orderly marshalling of facts, and by deducing from them their logical outcome; and chiefly in endeavoring to control conditions which may be utilized for the lasting good of our people.' Sir William Ramsay, in his presidential address to the British Association for the Advancement of Science, 1911.

## What Did You Do Today, My Friend?

What did you do today, my friend, from  
morn till night?

How many times did you complain that  
rationing is too tight?

When are you going to start to do all of  
the things you say?

A soldier would like to know, my friend,  
What did you do today?

We met the enemy today, and took the  
town by storm,

Happy reading it will make for you to-  
morrow morn.

You'll read with satisfaction the brief  
communique;

We fought—but are you fighting? What  
did you do today?

My gunner died in my arms today; I feel  
his warm blood yet.

Your neighbor's dying boy gave out a  
scream I can't forget.

On my right a tank was hit, a flash and  
then a fire—

The stench of burning flesh still rises from  
the pyre.

What did you do today, my friend, to help  
us with the task?

Did you work harder and longer for less,  
Or is that too much to ask?

What right have I to ask you this? you  
probably will say—

Maybe now you'll understand; You see—  
I died today.

Author Unknown. (CNS)

As printed in 'Wings Over Olmstead,'  
March 1, 1944. Publication of Middletown  
Air Service Command.

In 1918 the average infantry divi-  
sion was equipped with about 3500  
horsepower of mechanized equipment.  
In 1944 the average infantry division  
has about 450,000 horsepower at its  
command.

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# TECHNOCRACY

## WHAT?

### WHAT?

★ Technocracy is the only American social movement with an American program which has become widespread in America. It has no affiliation with any other organization, group or association either in America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 25 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are \$6.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy—the Monad, an ancient generic symbol signifying balance.

### WHERE?

★ There are units and members of Technocracy in almost every State, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Victory Program with any interested people and Continental Headquarters will be pleased to inform anyone of the location of the nearest Technocracy unit.

## WHERE?

## WHEN?

### WHEN?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance—a research organization. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

### WHO?

★ Technocracy was built in America by Americans. It is composed of American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this country. Membership is open only to American citizens. Aliens, Asiatics and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife—as long as you are a patriotic American you are welcome in Technocracy.

## WHO?



# GREAT LAKES TECHNOCRAT

**25c**

**JULY - AUGUST, 1944**

**25c**

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# GREAT LAKES TECHNOCRAT

JULY-AUGUST, 1944



VOL. 11



No. 11



WHOLE NO. 68



Illustrating the Futility of Price System Methods of Operation; Interpreting the Trend of Events from the Social Aspect of Science; and Presenting the Specifications for Total Victory in America's War Against Fascism.



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## TECHNOCRACY DIGEST

625 W. Pender Street

Vancouver, B. C., Canada



# Postwar Planners' Blues

Free Enterprise Sees Ghosts

by Oliver Moffatt

---

Private enterprise takes credit for everything 'good' in America. But did you ever hear it claiming credit for anything 'bad.' Not so you could notice it! The 'good' comes about as a result of the glories of freedom of opportunity to chisel. The 'bad' is caused by bureaucrats and the Government. Poor old business must have a persecution complex. After this war is over America will be faced with, among others, four major problems. Private enterprise will have a chance to demonstrate its ability or disability to cope with these problems before going down for the long count from which there is no recovery. Let's look over these four problems and see what chance poor old business has.

---

## *Count Your Troubles One By One*

THE problems that faced Price System institutions before the war are the same problems that will face them after the war. There will be a difference in magnitude only. The war will have intensified and magnified the Price System's troubles.

Here are four main problems that must be solved by all Price System postwar planners. Incidentally, Technocracy is not one of those planners.

1. Debt problem.
2. The technological problem of what to do with our enormously expanded plant and \$50 billion or more surplus war ordnance and equipment.
3. Unemployment problem.
4. Foreign trade.

## *It Would Make Good Wallpaper*

First, let us consider the debt problem. In the matter of debt, Americans are economic illiterates. That

is, they have no clear conception of how the Price System works. They confuse money wealth, credit, debt, and the whole financial structure with the industrial plant, farms, natural resources that supply us with food, clothing, shelter, and all goods and services. Technocracy sums it up in these words:

The injection of monetary concepts into all discussion of national wealth and income wholly confuses the people as to the actual issues at stake, and furthermore serves as a handy screen behind which, with a little word juggling, the business-political operators of the Price System can continue their profitable activities without being too greatly embarrassed by outside interference. It is high time that the significance of national wealth and income be understood by every citizen on the North American Continent.

The majority of the American people do not realize that the debt structure of the Price System must expand constantly or the system will die. New debt must be created at an ever increasing rate in order to keep pace with the advance of technology. At the same time there are less sources of reinvestment, and the rapidly accelerating rate of payoff is driving financial institutions into that state of total liquidity wherein the interest rate approaches zero.

We don't have to go back far in history to produce examples on the operation of the debt structure. Total long and short term debt, approximate figures from various commercial and governmental sources and private statistical institutions, are as follows:

1914....\$130,000,000,000

1929....\$310,000,000,000

1933....\$238,000,000,000

1943....\$410,000,000,000—plus

You might want to know how we got from 1914, when total long and short term debt, both public and private, stood at \$130,000,000,000 to \$310,000,000,000 in 1929. In that 15 year period, the Federal debt expanded \$12,000,000,000; \$9,000,000,000 was added by installment buying; \$22,000,000,000 was in the form of foreign loans; \$6,000,000,000 was added to State and municipal bonded indebtedness. Private debt added \$130,000,000,000 in long and short term items to its total. In 1929 the private enterprise boys had to call a halt on private debt expansion in order to make their outstanding debt valid, thus causing the debt

structure to contract instead of continuing to expand. You all know what happened. Some \$70,000,000,000 of that private debt was written off the books, and by 1933 the total internal debts of the United States, according to Evans & Clark, stood at \$238,000,000,000. In order for business to continue operating, the Government had to take over the function of creating new debt. This was instituted in 1932 with the formation of R.F.C.

### *Priming Will Wreck the Old Pump Yet*

The pumping of funds into the debt structure at the top proved inadequate to stem the tide and meet the needs of the American people. With the advent of the New Deal, Government funds, i.e., public money, was then applied at the bottom to the low income consumer, who spends all he gets buying what the farm and factory produce, thus keeping the wheels of industry turning. While this measure of the Government unbalanced budget has not brought about any real advance in the distribution of America's abundance, it did halt a chaotic period and stave off social change, with the probability of a more chaotic period in the future. In ten years the \$238,000,000,000 debt of 1933 has increased to \$410,000,000,000-plus. \$15,000,000,000 of this is State and municipal debt, while \$186,000,000,000 is debt of the Federal government. Approximately one-half the total debt is now public debt. In 1914, the public debt was less than 1/12th of the



total. Quite a change in a short period of 30 years, isn't it?

The greatest amount of this increase in public debt has taken place in the last four years. In the first eight years of the New Deal the public debt expansion was at the average rate of \$4,000,000,000 a year. In the last four years the public debt expansion has been at the average rate of \$37,000,000,000 a year. Doesn't this give you a clearer picture of what is happening within our financial structure?

Those who have studied the function of the Price System know that to attempt to level off or decrease the debt would bring a depression similar to, but greater than, 1929-1933. They also know that we cannot increase the debt forever. There are some business men, economists and politicians who realize this. In Leon Henderson's article 'Can We Keep Our Heads After Hitler Loses His' in the February 1944 issue of the *American Magazine*, we find one individual who frankly admits that private enterprise has not found an answer:

Finally, there is the question of Government spending, when and if private activity fails to give enough jobs. We sweated through that question all through the 1930's and we still don't know the answer.

There is an answer, but it does not lie within the realm of Price System operations. Private business, by itself, has never been able to spend the required amount of money nor employ the necessary number of people

required to guarantee America's Price System operation since the advent of the R.F.C. in 1932. The Government of the United States has stepped into the breach and taken up the slack in debt creation and employment since that time and has been doing it at an ever-increasing rate since the start of the war.

### *The House That Technology Built*

Let us look briefly at the second problem; the expanded facilities and \$50,000,000,000 worth of surplus ordnance and equipment. How much has the industrial plant of this Continent expanded? The aluminum production capacity of the United States alone is seven times greater than 1937. The steel industry could easily double its 1937 production of 52,000,000 tons if it operated at full load capacity. If and when a few new Government and private plants, not yet completed, get into operation, steel production will jump still higher; 89,000,000 tons of steel were produced in 1943.

Plastic production of 600,000 tons in 1943 was many times 1937's production. Factory output, according to a chart prepared by the Alexander Hamilton Institute, showed production at 100 percent in 1919; 117 percent in 1929; 123 percent in 1937; and 217 percent in 1943. There were 122,000,000,000 kilowatt hours of electricity produced in 1937; in 1943 there were approximately 210,000,000,000 kilowatt hours produced. Yes, an expansion of 88,000,000,000 kilowatt hours in 6 years; and one kilowatt does the work of 13 men

when applied to the machine; 88,000,000,000 times 13—you figure it out.

Is it any wonder that America can out-produce any other country in the world? It's because the majority of other countries are still depending on man-hours of labor. The ironic part of this increased electric capacity is that it has come from large hydro-electric projects built and financed by the Government, with public money. Some of these projects were depression-planned to help combat unemployment, and nearly all of them had been opposed by private power-producing companies or other financial interests. Despite their lack of integration into a Continental hydrology, we can still say: 'Thank God they were built.' America's industrial capacity, that is, her capacity to produce, has almost doubled since 1937.

Take the example of the airplane industry. In 1939 it employed 70,000 people, producing \$280,000,000 worth of products. In 1943, 1,700,000 people were employed producing over \$25,000,000,000 worth of products. The postwar period, it is estimated by the Vice-President of the Fairchild Airplane Corporation, should keep 275,000 to 300,000 people at work producing \$2,000,000,000 worth of products. Today the airplane industry is producing war planes at a tremendous rate. It has only one customer, Uncle Sam. Lend-Lease is Uncle Sam too. After the war, \$1,200,000,000 of that \$2,000,000,000 worth of business, it is esti-

mated, will still come from the Government.

There is no doubt that we will continue to maintain an up-to-date air force; hence we will need up-to-date planes. This postwar estimated \$1,200,000,000 yearly Governmental business would necessitate the immediate junking of the tremendous air force we will have at the war's end and the junking of every plane under construction at that time. This may make sense to the business men who must continue to sell planes in order to make a profit, but the American taxpayer must pay for this kind of business.

### *All in the Same Boat*

In addition to the postwar reduction in dollar volume of business in aviation, there will be a reduction in volume of physical production. This is significant, because it affects other industries, the major one of which is the aluminum industry. Approximately 75 percent of the weight of an airplane is aluminum. What will the aluminum industry do when its major customer no longer needs its products? This also affects the railroads, as they are busy transporting aluminum, airplane motors, parts and other equipment all over the United States. This, in turn, affects the steel industry, which makes the steel to make the railroad cars, diesel and steam locomotives, other railroad equipment, airplane motors and the machine tools used in manufacturing these articles. It is acknowledged that at the war's end the United



States will have on hand enough machine tools to last for the next ten years. What is the machine tool industry going to do for customers? What are we going to do with this increased industrial capacity? Who owns it? Who will run it?

Leon Henderson puts it this way in his article in the February issue of *American Magazine*:

When the war finally ends, the Government and the Armed Forces will probably have on hand surplus goods and materials worth some \$50,000,000,000. Quartermaster officers tell me that half, or \$25,000,000,000 worth of these goods, can pass into the retail market. Socks and underwear, safety razors and toilet articles, drugs and medical equipment, typewriters, stoves and blankets, to mention just a few. Then there are the government-owned metals, such as copper, zinc, lead and aluminum. Eighty percent of the aluminum capacity belongs to the United States Government; 90 percent of the magnesium capacity, all of the synthetic rubber-making plants, 90 percent of the new airplane factories-in-aggregate, a mighty industrial empire, are now owned by the Government.

#### *'To Be or Not To Be—'*

The implication of these statements are not realized by very many Americans, even if they knew of or have read them. Here will be a vast

amount of goods which, if released to the market, will depress prices, and factories producing similar articles will be forced to shut down. On the other hand, if these articles are destroyed, the people most in need of them will suffer, and the taxes on the debt contracted to produce these articles cannot be lowered. Taxes reduce the purchasing power of the great majority of the population, who then will not have the necessary purchasing power to buy the articles produced and sold by private industry. This should give you some idea of the dilemma that faces the Price System institutions on this surplus capacity and material problem.

Technocracy sums it up this way:

At the end of the war, the North American Continent will be in possession of an immensely productive machine, and the controllers of that machine will be faced with the grim alternative of either throttling and dismantling it or operating it at its current high level. In the event it is throttled and dismantled, the operators will be faced with the problem of 20,000,000 to 30,000,000 unemployed. In the event it is operated at its present high level, the operators will be faced with the problem of distributing its output. Either of these situations will demand radical and revolutionary solutions, in the sense that they will have to be wide departures from any of the current postwar plans of either business or Government.

### *Buddy, Can You Spare An Apple?*

The third problem is the unemployment problem. The majority of people realize that the unemployed have to be supported by some means. They are a drag on the rest of Price System society, who must pay higher taxes in order for Government to support them at a bare existence level. Under the Price System these people cannot contribute their proportionate share toward the operation of the system. They can do so only in time of war.

Here's a conservative estimate on postwar employment. While not exact, it is accurate enough for our purpose in illustrating the trend of employment from 1929 to 1933 and up to the first war year of 1940. Sources cited are the U. S. Statistical Abstract, the Department of Commerce, Bureau of Labor Statistics and the World Almanac. A couple of the figures on unemployment and employables are estimates derived from the figures given for census years.

displaced by technology. The 30 percent is the total of a calculated 5 percent annual increase in output per man-hour for the six years between 1940 and 1946. A 5 percent annual increase in output per worker for the years named is a very conservative estimate. Official figures of the Department of Commerce cite a yearly increase of 2½ percent in output between 1929 and 1941. This was the period of the unproductive, long depression. In fact, in the first 6 years, 1930 to 1936, production was very low. Most of the increase in output per worker, between 1929 and 1941, actually occurred between 1936 and 1941.

No account is taken here of the new employables that have been added to the labor force since 1940, about 600,000 each year. Most of them will be unemployed in the postwar period. Neither is any account taken of millions in the service and light industries who will be unemployed because of general depression conditions, not directly connected to technological displacement of labor.

#### *Population — Labor Force — Employment — Postwar*

	1929	1933	1940	Postwar?
Population .....	122,000,000	125,000,000	132,000,000	136,000,000
Total Civilian Labor				
Force .....	49,000,000	51,400,000	54,900,000	57,500,000
Total Employment ...	47,000,000	35,400,000	46,000,000	31,350,000
Unemployment .....	2,000,000	16,000,000	8,900,000	26,150,000

The figure for postwar unemployment is derived by subtracting a 30 percent technological displacement of labor from the postwar labor force, added to the 8,900,000 unemployed of 1940 who had previously been

All in all, a 50 percent relief load stares us in the face after the war.

Labor unions, fighting to maintain wage rates, have so roused the ire of some industrialists that these gentry will do anything to break the power



of the unions. This hate is a stimulus to mechanize to the limit. Others, through their laboratories and research staffs, will go on with mechanization and modernization as a matter of policy.

Man-hours per unit of production has continued to decline even under the cost-plus payroll padding system. It will do so even more spectacularly when the Government withdraws this artificial support from poor old business.

### *A Factory in Every Port*

This brings us to the last problem facing our unrealistic planners: foreign trade. Most of the planners are worried about what Russia is going to do. They are afraid that if Soviet Russia dominates the majority of European nations, it will eliminate private ownership and set up huge state-controlled industries. American business is interested in profits and customers, and anything that would stand in the way of their freedom to chisel must be opposed and eliminated by any means at their disposal. They do not realize that technology, not politics, eliminates customers. If the technology of Europe advances as technology has advanced in Russia during the last ten years, then the fears of American private business will be realized. The part that technology is playing in the world outside of Europe has not been recognized by American private business. Being so intent on profits, customers and worrying about Russia, business does not realize that many of its cus-

tomers will soon be its competitors.

Australia before the war was the supplier of raw materials and mineral resources to British industry, a buyer of machine tools, farm and transportation equipment. Australia today has a machine tool industry of her own, produces much of her own mining and farming equipment and builds ships up to ten thousand tons. Her industries will also be looking for customers after the war.

Due to the inability of England to completely supply the Indian market during the war, India's industries have begun a process of mechanization and India won't be the customer she was before the war. Her own industries will partially supply her own needs and there is a possibility that she may continue to mechanize her industries until she can supply her home market.

Next comes South America, long the happy hunting ground for American business. Brazil used to buy finished steel products from England, America and Germany. In 1942 a complete steel plant was constructed in Brazil, with American materials and money. It went into operation in 1943. Other factories and equipment were sent to South American countries and they are now filling many of the industrial needs of that Continent. If the trend continues, South America will also be hunting customers for its expanded industrial plant.

Canada also has stepped up her industrial production. The Shipshaw project of the Aluminum Company of Canada will have an enormous

amount of aluminum and hydro-electric power to sell. To whom? For what?

American business looks for a greatly expanded export trade after the war in order to keep the wheels of American industry turning. Every other industrial nation wants to do likewise. They all want to export as much as possible and import as little as possible, and many of their goods are similar in kind. Machine tools, steel, transportation, farm and mining equipment, textiles, drugs, chemicals, and farm products. This would mean that from a world-wide shooting war, we would go into a world-wide economic war. The alternative to this under the Price System is to freeze social change under a world-wide fascistic cartel system. This would maintain profits and scarcity, hand tools and human toil, and operate for the benefit of a select few at the top. America's civilization is diametrically opposed to that type of operation.

### *Wanted: One Master Plan*

The international situation offers no solution to business' postwar headache, and the sooner Americans realize that here on this Continent is the greatest array of technological equipment ever at the disposal of a people, a vast amount of natural re-

sources and a Continent with a geographical position second to none, then we will cease organizing for alien nations and ideologies and organize for America, along the lines dictated by her technology. Then and then only will the future greatness of this Continent be assured.

Technocracy is the only organization with an all-time plan, based on America's technological civilization, that is designed to meet this threat to America's future. That plan is Total Conscription of Men, Machines, Material and Money, with National Service from All and Profits to None, to be instituted for the duration and six months thereafter. That plan is designed to meet both the war and the immediate postwar problems. Without such a plan in operation, a chaotic period is most likely to ensue.

Technocracy is organizing for America. Its program is TOTAL CONSCRIPTION. It is organized for a planned, technological America, and to prevent chaos. It challenges your investigation. It asks your help.

Where else can America look to for help except her citizens? Poor old business is doddering into senility. America is young, vibrant and full with physical promise. It's your land and my land! Let's make America what it can be. Investigate Technocracy!

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Factory employment has dropped by 600,000 in four months. Right now that's the nation's most critical economic trend. It's made doubly critical because our economic high command—officials in charge

of procurement, production and manpower—can't agree on what it means. Worse, if the sharp trend continues, it might precipitate a crisis before long. — *Business Week*, April 22, 1944.



# My Kingdom for a Cook

## Technocracy In A Nutshell

by Lilly Yngve

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The first question a great many visitors to Technocracy Sections ask is: 'What's it all about?' Considering that it has taken 24 years of research to compile the body of thought called Technocracy, that is quite an order. The public seems to have a complex in favor of explanations in a nutshell. Usually the visitor has only a few minutes to spare, so the best we can do is give him a few choice nutshells and suggest that he read our literature. Here's what happened to one such visitor.

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### *Scene: Any Technocracy Section*

*Visitor:* (Walking in with a T.C. Leaflet in his hand which he had taken out of the holder by the front door): 'This looks interesting; what's it all about?'

*Secretary:* (Who had been observing him while he looked over the window display). 'It's all about the North American Continent. Suppose we liken it to a gigantic bowl filled to overflowing with Combination Salad. It's being served to 200,000,000 assembled Guests.'

*Visitor:* 'North America—bowl—salad — 200,000,000 — what the —; say, I must be in the wrong place.'

*Secretary:* 'Don't get excited; you're in the right place. Yes, we said salad but we are sorry to have to add that the Chef has made a mess out of it. It's not very appetizing. He put in too much oil, for one thing, and instead of tossing it lightly together has stirred the ingredients into a sloppy conglomeration.'

*Visitor:* 'Say, what kind of a place is this?'

*Secretary:* 'Never mind about that now. There, sit down, that's better. Now, as we were saying, everything is in an uproar and the assembled Guests don't know what to do. A few nibble at the salad once in a while with a sort of puzzled expression. Some gulp it down and ask for more. One group examines the mess and, concluding that it is not fit to eat, pronounces that it will cause chaos in the internal structure if not gotten rid of.'

*Visitor:* 'This doesn't make sense.'

*Secretary:* 'No interruptions, please. Remember, you asked me to tell you what it is all about. Now, this latter group, who had examined the messy salad, suggested that the Chef be fired, and one engaged in his place who could prepare a well-balanced dish. They named a Dietitian for the job, an expert in healthful salads. But the Host protested and praised the concoction, bidding his Guests to remember all the wonderful dishes that same Chef had prepared for them in the past.'

*Visitor:* 'Before I go screwy, too, please tell me who is the Chef and the Host, and what's in the salad, and what do you mean by too much oil, and who are the Guests?'

*Secretary:* 'One question at a time, if you don't mind. The Chef is the Price System and the Host is Private Enterprise. The salad ingredients are the natural resources of the North American Continent. They are such things as minerals, waterpower, forests, croplands, energy, technology and our industrial plant and equipment. In our Price System salad these are blended indiscriminately with crime, poverty, malnutrition, ignorance, illiteracy, minority group squabbles, neglected children, juvenile delinquency, hand tools, human toil, enforced scarcity, regimentation, war profits, chiseling, wealth and special privilege for the few, and native fascism. The oil in the salad is a blend of merchandising methods, advertising, money hallucinations, debt and politics. No wonder it's a mess.'

*Visitor:* 'I begin to catch on now. And—the Guests are the American people.' He straightened up in his chair and took off his hat. 'Say, you've got something there.'

*Secretary:* 'You bet your life we've got something, but that isn't all. As you say, the Guests are the American people and they are divided into three groups; (1) those who believe anything and swallow everything the Price System has to offer; (2) the skeptics who know that something is rotten somewhere but just can't figure it out; and (3) the Technocrats,

who have analyzed the salad, examined the operating characteristics of the Price System Chef, separated his sloppy dish into its component ingredients, strained out the oil, and exposed the whole mess for what it is.'

*Visitor:* 'I got that all right, but what is a Price System?'

*Secretary:* 'A Price System is any social system whatsoever that regiments its citizens to lifelong scarcity and insecurity by enforcing merchandising methods in the production and distribution of goods and services.'

*Visitor:* 'Well, I'll be damned.'

*Secretary:* 'Yes, you are and will continue to be if you don't do something about it. But we haven't finished our story yet. The Dietitian whom Technocracy recommends is Total Conscription. It is equipped with the measuring cup of science and technology and has worked out a well-balanced recipe for a healthful salad. This consists of an equal blend of Men, Machines, Materiel and Money, with National Service from All and Profits to None. It eliminates the harmful ingredients from our social system and our war effort. It will save an untold number of lives, shorten the war, preserve our natural resources and defeat native fascism, as well as the foreign variety. Besides that, it will provide a peaceful transition period and guarantee America against chaos in its internal structure in the postwar period. That's what it is all about, Mister. What did you say your name was?'



*Visitor:* 'My name is Smith. I'm just an average guy, but this sounds like the real thing to me. I have to go to work now, but where can I find out more about this?'

*Secretary:* 'Right here. Take some of this literature along with you. This Section is open every day and evening. We have Study Classes and lectures. Here's our calendar of activities for this month. Technocracy welcomes your investigation. Please come again when you have more time to spare. So long, Mr. Smith, glad you dropped in.'

*Mr. Smith:* 'Same here. I'll read these magazines and come to the lecture on Sunday. Wait till I tell the guys at the shop about this. Maybe a couple of them will come with me. Well, goodbye, see you later.'

Mr. Smith walked out the door and gave a parting sidewise look at the window display on his way up the sidewalk.

The Secretary turned back to one of those innumerable tasks that are always piled up and waiting for every Secretary and Member in every Technocracy Section Headquarters. But there seemed to be a slightly firmer tilt to her head and a trace of a smile played around her eyes.

Maybe she was thinking that the big job to be done in reaching the millions of Mr. and Mrs. Smiths, if America is to attain its greater destiny, seemed a wee bit lighter than before this Mr. Smith had walked in. Maybe she was thinking about that Combination Salad. Who knows?

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### Room For Only One

*'Technological and institutional habits of thinking are now fundamentally in conflict.* Our modern culture is basically contradictory in nature. In its technological aspects it is essentially rational, dynamic, and relativistic; but in its institutional aspects it is predominantly emotional, static, and absolutistic. When analyzing our technology, for example, we proudly exalt progressive, experimental, and scientific outlooks; but when examining our institutions we angrily defend traditional, established, dogmatic viewpoints. The result of this intellectual dichotomy is growing popular confusion, bewilderment, and social strife.

*'Our generation must, therefore, choose whether to decrease technology or to increase public planning.* Technology has produced an interdependent society, and increasingly our basic civic problem is that of harnessing the gigantic powers of modern technology to promote the universal welfare of man. Technology and planning are functionally synonymous; if we would expand the one, we shall have to extend the other in commensurate degree.' Excerpts from *Educating for Social Perspective* by Edward G. Olsen, Director of the School of Education, Russel Sage College, Troy, N. Y. in the *Journal of the National Education Association*, December, 1942.

# Background to Danger

by Harry Elmer Barnes

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I HAVE pointed out in several articles that probably the chief reason why we face so many, so vast, and so apparently insoluble social problems, both at home and abroad, is the phenomenon of cultural lag—the fact that our machines have got out away ahead of our social institutions and social thinking, with the result that we are trying to control a dynamo technology with windmill institutions.

Most readers of these articles who have offered any comment at all seemed to agree with this general idea. But a number have asked me to go further and explain how this cultural lag—this gulf between machinery and institutions came about—and why we do not bestir ourselves to do something about it all. I will take a couple of articles to deal with this important matter.

A little reflection on the history of modern times and social psychology makes it easy to understand how this dangerous disparity between our material culture and our social institutions has come about. It is not, as some suppose, because our institutional development in modern times has been slower than in earlier ages. As a matter of fact, institutional progress has been more rapid since 1500 than in any other period of comparable length in human history.

## *Middle Class Pressure*

What has brought about the great gulf between machines and institutions in our day is the fact that science and machinery have gone ahead with a rapidity never dreamed of before. There has been greater scientific and mechanical progress since 1500 than in the whole million or more years of human experience before 1500. Institutional development, even though relatively rapid in the last four centuries, has simply not been able to keep pace with scientific and mechanical progress.

Another important element in the situation is that the powerful business classes have, since about 1750, thrown the whole weight of their influence to stimulate science and machinery, while they have, at the same time, sought to stabilize institutions and frustrate social change.

In early modern times, there was actually a greater social impulse to institutional changes and to new types of social thought than there was to the progress of science and invention. Between 1500 and 1750, as the Middle Ages came to an end and modern times came into being, these changes were mainly the product of the agitation of the new mercantile middle class.



The middle class repudiated most types of medieval institutions and social thought. It helped along the growth of the national state and transformed it from an absolutistic to a representative basis. It created constitutional government. It developed the ideas of natural law, which placed jurisprudence behind the protection of property. In conjunction with the Protestant ministers, the middle class brought into being the capitalistic system and the eulogy of pecuniary profits.

The middle class took an active part in colonialism and the creation of modern imperialism; developed an appropriate type of political and economic theory to justify the new bourgeois system; and brought into being the liberal political philosophy, justifying revolution against the privileged aristocracy and defending outstanding civil liberties such as freedom of speech, press, assemblage, religion, and the like.

In economics, the middle class extolled the freedom of trade, and the immunity of business from extensive governmental regulation.

These sweeping institutional changes, which we have just summarized, were far more rapid and extensive than the mechanical advances between 1500 and 1750.

### *Our Simian Heritage*

Most of these innovations in economics and politics had been executed by the close of the 18th Century. The system thus created by the middle class tended thereafter to

crystallize and to resist change. The middle class turned its attention from undermining medievalism and absolutism to defending the new social order it had created.

In this way, the very social class which, between 1500 and 1750, had strongly encouraged the transformation of institutions and social thought, became an insuperable obstacle to social change in the 19th and 20th centuries. After it had built the new bourgeois social order, the middle class believed that its interests were linked up with preserving the status quo in institutional life and social thought.

Hence, the business and financial classes threw all of their tremendous power into the maintenance of things as they are in our institutional life. This they did at the very time when they were becoming most enthusiastic in the way of promoting progress in science and technology in the hope of increasing their business profits.

Therefore, from about 1750 to the present time, the dominating social and economic groups in modern society have tended to resist social and institutional change, while at the same time they have encouraged advances in science and technology.

This is a main reason for the strange and alarming state of affairs we face today: namely, the juxtaposition of a thoroughly up-to-date science and technology and a heritage of antique social institutions and social thought which date, for the most part, from around 1800 or earlier. Conditions in our modern

world have, for more than a century, worked strongly, on the one hand, for scientific and mechanical advance, and on the other hand, for institutional stability.

Another important cause of cultural lag is to be found in the fact of our simian heritage. As simians, we are very "handy" and like to fuss and experiment with material things. We are organically interested in gadgets and favor and foster those who can provide bigger and better gadgets for us. In this way, we are naturally inclined to stimulate scientific research and mechanical invention.

### *The Alternative We Face*

On the other hand, the abstract thought and social vision required for conceiving and planning social change come hard for us. There have been countless millions of "handy" humans, but not over a hundred outstanding philosophers during all recorded history. There have been thousands of Newtons and Edisons, or at least of lesser Newtons and Edisons, but only a mere handful of social inventors—Jean Jacques Rousseau, Jeremy Bentham, Karl Marx, Edward Bellamy, Leo Tolstoi, Henry George, and Thorstein Veblen are about the only outstanding ones who readily come to mind.

Further, science and invention have been pretty thoroughly secularized in modern times. We no longer regard a scientific invention or a mechanical improvement as sacriligious. But a quasi-supernatural

aura still shrouds our institutional life. We continue to confer sanctity on our existing form of government, economic life, religious beliefs, and moral codes.

Therefore, while scientists and inventors can proceed with public acclaim, our social reformers must contend with all the horror and savagery which greeted the theological heretic in the Age of Faith. We throw our hats in the air to greet a new giant air bomber, but throw a spasm of terror when confronted by a modest proposal to reform the Supreme Court.

It is quite obvious that no civilization can long endure with such an extensive lag between the two great aspects of its structure and life processes. It is this great institutional gulf which has brought on the fourth world-revolution and forced upon us the necessity of either making constructive readjustments or facing social chaos and disintegration.

In the gulf between machines and institutions is the chief cause of all current difficulties and disasters, from poverty to war and from education to crime, it may seem surprising that so little is being done to remedy this situation. But a little appeal to social psychology and cultural history is sufficient to explain our lamentable defects and failures in this respect.

One of the most conspicuous things about the mental life of our day is the contrast in our attitude toward modernity and efficiency in science and machinery, on the one hand, and in institutions and social thought, on



the other. We desire, and, if we have money enough to buy them, we get for ourselves the latest automobiles, radios, plumbing, and electrical gadgets—at least we did so before war and rationing.

We are humiliated by any evidence that we are behind the times in such matters. The average American would be greatly embarrassed to drive a reconditioned 1923 Dodge touring car through the thoroughfares of our main cities. This would be the case, even if the car were in new condition. The mere fact that its model was two decades out of date would provide sharp humiliation for the owner.

### *Gulf Is Widening*

But the very person who would be embarrassed by a motor car two decades behind the times is likely to demonstrate great enthusiasm, if not sheer reverence, for a constitution a century and a half old, or for an economic system which was already being extolled by Adam Smith in the year 1776. The man who expresses great contempt for the transportation ideals of the horse-and-buggy era usually defends with gusto and conviction political and economic ideas which antedate the stagecoach.

This situation makes it very difficult to do anything to bridge the gulf between machines and institutions. So long as we are proud of our institutions and ideas in direct ratio to the antiquity of their origin and their inadequacy in meeting current needs,

we have less than any incentive to bring them up-to-date. Until we are as much embarrassed by an archaic idea or social practice as we are by an obsolete gadget, there is little prospect of making any headway in the transformation of our institutional equipment.

Far from taking steps to bridge the gulf by bringing our institutions up-to-date, the intellectual attitudes and social values of our era actually tend to widen the gulf.

Our simian traits make the inventor and mechanic far more interesting to us than the social philosopher and social planner. Indeed, the latter usually bore, annoy, or actually alarm the average person, while those who bear new gadgets delight and charm him no end. Hence, mankind is on the alert to encourage new machines and to frustrate, avert, or ignore proposals for social change.

### *Special Inventors Needed*

We provide all sorts of prizes and monetary rewards for scientists and engineers who make important discoveries. Yet, we do not urgently require any additional scientific discoveries and mechanical inventions for the moment, save perhaps in the field of medicine.

What we need more than anything else today are the contributions of the social inventors—those who can bring our institutions and social thinking up to date by devising new and better forms of government, economic life, legal practices, and moral

codes, and improved educational systems.

But we have few or no prizes or rewards for the social inventor. At best, he is likely to be ridiculed as a crank or nitwit. In certain countries, he may be imprisoned or shot. The net result is an extension of the already menacing abyss between our science and machinery and our institutional life and social thought.

It is not surprising, then, to find a sharp contrast between the type of guidance which we demand in the field of science and technology and that with which we rest satisfied in regard to our institutional procedure.

For example, if we are ill we want the very finest medical scientists and surgeons we can afford. We would be inexpressibly shocked at the suggestion that we should call in, for an operation, the family butcher, who might possess remarkable facility as a skillful meat-cutter. In short, when there is an operation to be performed upon the human body, we wish the most competent brain trust which we can obtain.

But, for operations upon the body politic, with problems far more complex and technical than any conceivable surgical operation upon the human body, we let ignorant and venal political butchers hack and mangle the body politic at their will.

Hence, we need not be surprised at the vast amount of bungling which goes on in contemporary political life.

Until we are as willing to call in experts to guide us in our institutional life and its problems as we are to seek the medical services of experts or to request experts to repair our gadgets, there is little hope that we shall be able to deal effectively with the complex problems of contemporary life.

It is obvious that this refusal to accept the aid of technical knowledge and expert direction in public affairs, just the reverse of our conduct with respect to private problems in the scientific and mechanical realm, restrains the bridging of the gulf between machines and institutions.

To sum up, we fail to bring our institutions up to date and adjust them to our science and machines because we do not see any reason for doing so, because most of us do not wish to do so but are rather inclined to venerate the antique in our institutional life, because we encourage scientific and mechanical progress while denouncing and persecuting social inventors, and because we persistently reject the aid of experts in public life, while insisting upon their service and counsel in almost every phase of our private affairs.

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'Whether we like it or not, ways will be found to use plant capacity in creating a world of plenty. The artificial scarcity boys—whether capitalists or government economists—will never be able to resist the demand of a world population which

has glimpsed such a world. . . ." Sterling North in Book Section, *Chicago Sun*, April 16, 1944.

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A jury is a body of 12 men who decide which side has the best lawyer.



# *Looking Forward to the 'Good Old Days'*

## RULES FOR EMPLOYEES 60 YEARS AGO DIFFER FROM TODAY

The past 60 years have changed rules affecting employees, as is shown by the following item, originally printed in the publication, "Joys of Life," and reprinted in "The Advertisor's Digest":

The following rules, vintage of the 1880's, were posted in an Amboy, Ill., store, operated by the founders of what is now called Carson Pirie Scott & Co., of Chicago:

1. Store must be open from 6:00 A.M. to 9:00 P.M. the year 'round.
2. Store must be swept; counters, shelves and showcases, dusted; lamps trimmed, filled and chimneys cleaned; pens made; doors and windows opened; a pail of water and bucket of coal brought in before breakfast. (If there is time to do so, attend to customers who call.)
3. The store must not be opened on the Sabbath unless necessary and then only for a few minutes.
4. The employee who is in the habit of smoking Spanish cigars, being shaved at the barber's, going to dances and other places of amusement will assuredly give his employer reason to be suspicious of his integrity and honesty.
5. Each employee must pay not less than \$5.00 per year to the church, and must attend Sunday school regularly.
6. Men employees are given one evening a week for courting, two if they go to prayer meeting.
7. After 14 hours in the store, the leisure hours should be spent for the most part in reading.

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# What Hath Technology Wrought?

by R. F. Novalis

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**The year 1944 witnessed three birthdays which mark memorable milestones in the progression of America's great technology.**

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*May 24, 1844—Telegraphy—  
100 Years*

It was just 100 years ago that Samuel F. B. Morse, after being turned down repeatedly by 'free enterprise' took his bag of electrical gadgets to the United States Government. The Congress listened. Some of its members saw further than the Mississippi and Missouri Rivers, further even than the business tycoons of that day. They appropriated \$30,000 from the public treasury for the purpose of developing the telegraph. One of America's early technologists was thus permitted to give the world the telegraph.

Annie Ellsworth, daughter of the then Federal Commissioner of Patents, gave Morse an appropriate message that she and her mother had selected from the Bible. It was: 'What Hath God Wrought?' This was tapped out by Morse on the first inter-city line from Washington, D. C. to Baltimore, Maryland, a distance of 40 miles. Thus telegraphy was proven. Its advantages were then realized by private enterprise, for private enterprise, and it was rapidly developed further. The nation's tele-

graph system is now a 99.9 percent plus monopoly, because its technological interconnections require a single control.

A telegraph is an electro-magnetic device that makes use of two basic electrical principles: (1) Electric current flows through any length of wire practically instantaneously, and (2) if this current is purposely interrupted, a code can be worked out by means of which words and sentences can be transmitted over great distances.

In Chapter 22 of *Technocracy Study Course*, the best methods of communication are described as follows:

Technically, there is no question that all communications of the entire Continent could be conducted by telephone if the energy cost indicates that this is not too expensive. It is equally possible to do the same thing by telegraph. . . . Whether the energy cost of handling communication by telephone or by telegraph is less than by mail available data are not sufficient to decide. They indicate, however, that the cost by wire would be at least as small as by mail, if not smaller.

Technologists have hit hard at the



telegraphers' trade. Recently there was the Multiplex machine. This gave many veteran 'key men' a chance to look for other jobs. Now, Western Union's laboratory has developed a 'telegraph office no larger than a mail box.' According to A. N. Williams, president, 'you merely press a button, drop your written message in a slot, and a facsimile is whisked over the wires to its destination.'

*May 10, 1869—Transcontinental  
Railroad—75 Years*

Within the years of no more than one man's allotted lifetime on this earth, North America has been spanned by steel rails, not once but many times. Seventy-six years ago James W. Toombs, then a small boy, crossed the plains in a 'prairie schooner.' A year later he joined several hundred laborers, Indians, soldiers and officials at a point 50 miles northwest of Ogden, Utah, and saw the golden spike driven which first tied this Continent together, technologically. On that day the Central Pacific and the Union Pacific railways joined their tracks. Five years before that America had almost been torn asunder by the Price System's politico - financial - business growing pains.

Technology spiked secession permanently at Promontory, Utah, on that historic day, 75 years ago. James M. Toombs is one of six persons still living who witnessed that event, and attended the anniversary 75 years later as an honored guest.

*April 14, 1894—Movies—50 Years*

The moving picture industry was born in a shoe store at 1155 Broadway, New York City, on the above date. Fantastic and moronic as some of its products are, it is nevertheless an important link in the series of communications inventions that have helped to make America great.

The first movie was called a kinetoscope. It was developed by Thomas Edison. In the early form of this instrument, the pictures were viewed through a peep hole. The peep hole psychology still hangs on grimly in the industry, but there are times when it shows evidence of growing up. Edison's invention has progressed through various stages. The kinetoscope soon became the nickelodeon and that, before men were aware, expanded into the chain theatre system. Then came the talkies and soon after that came technicolor. The next step, television, is on its way. It will reach mass distribution when, as, and if the technical problems connected with it are solved, and the \$5,000,000 a year interference fund of the movie magnates can be outflanked, or by-passed. Television is a union of radio and movie.

Technology, of course, will win in the end. Victory, however, will not be complete until technology can distribute television as well as produce it. And that goes for all the other communication inventions, too!

# Are Women the Weaker Sex?

Reprinted from *Section Activities*

A Bulletin of 11834-12 El Monte, California

## *Always at the Stirrup*

Whether the individual species of the animal kingdom walks, swims or flies, the major portion of the function of procreation to preserve its kind belongs to the female.

History reveals that until recently feminine influence has never had any appreciable part of the responsibility for social change, even though women have been the principal victims of economic maladjustments.

It has always been the women who prepared the food, assisted in home duties and raised the children—acting as doctor, nurse, schoolteacher and dietician, as well as mother.

The Indian tribes made pack horses of their women who did all the work. The man was considered a superior being, born to enjoy domestic comfort and hunting, fishing and fighting tribal wars.

The pioneer women in early America were a courageous lot. They helped their men fight the wolves and Indians, assisted in the fields and taught school, first in the little red schoolhouses and later in more modern institutes of learning.

The first modern World War No. 1 revealed that women were indispensable in nursing the wounded, assisting the doctors and sharing the hardships of military life with their men. After this demonstration, re-

luctant political leaders were forced to concede to the women the questionable privilege of voting in an effort to 'purify' politics. They could vote only for one man as opposed to another, the extravagant promises of neither ever being carried out.

Since women demanded still more privileges from life, they were encouraged to form various clubs, organizations and societies to use up surplus energy. In industry they were encouraged to work as bookkeepers and stenographers. They were allowed to take up art, music and to enter the entertainment fields. Women were conditioned to desire frequent changes in clothing styles and the extravagant use of cosmetics, hair dye, nail polish and ornaments.

## *Woman Is Centripetal*

During the depression years, women had to be content with fragile stockings, thin-soled shoes, second-hand clothing and hand-me-downs for themselves and families. Married life must be endured without good warm bedding or matched dinner china. Pots, kettles and pans were of such poor quality as to be a disgrace to this civilization. Women worried along without glasses, dental work or medical care.

Today women are coming into their true social heritage. They have formed the WAVES, the WACS and



many other branches of feminine military units. They are doing their part in serving on draft boards, in rationing offices, driving trucks, buses, taxis, tractors, and operating factory machinery. Women knew their country needed them and volunteered rather than be drafted.

Now that women have had a taste of mechanized living at work, they will never consent to go back to anything other than a technologically efficient 'machine for living' with which to make a home for herself and family.

This will require social change on the North American Continent on a scale never known before. Women will for the first time demand their fair portion of the responsibility in determining the direction taken by that change.

We can expect that the women of America will challenge the old order and demand Total Conscription, not only as the vehicle to bring about the swiftest termination of this war to defeat fascism—but also as the most efficient mechanism by which stabilization can be achieved here in America after winning the war.

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### **Post-War Planners Take Notice**

'The cosmic planners, who base their bright new worlds on the words uttered by statesmen or on words written by statesmen on pieces of paper, are building their house on the sands. Those who attempt to regiment the world into a static society are attempting to harness the whirlwind. Not words, but atoms, electrons, molecules and infinitesimal bacteria controlled by men in white in laboratories are what the planners should study. More than rhetoric, they will fashion the shape of things to come.'—Excerpt from an editorial in the *Chicago Daily News*, March 23, 1944.

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'I submit that this challenge to use our resources in peace as fully as we are now using them for war will become, after all, the Nation's economic problem No. 1. — Of one thing we can be perfectly sure: sooner or later

the American people are going to lose patience with an economy that can only function fully under the whip of a desperate war; which in peace tolerates unemployment and poverty in the midst of potential abundance.' —Jos. G. Knapp of the Farm Credit Administration, before the National Farm Bureau convention in Chicago, as reported in the *Missouri Farmer*, February 15, 1944.

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'The Price System. In the operation of modern economic activity the central position is probably occupied by what is known as the "Price System." This exists in all countries where money is used for the purpose of exchange, which means that it is used practically all over the world today, and indeed during the past several centuries.'—Chapter XXVIII heading in 1942 book, *America In Transition*, by J. A. Kinneman and Richard G. Browne, the latter of the Department of Social Science, Illinois State Normal College. McGraw-Hill Book Company.

# Calling All Americans

## An Editorial

SCIENTIFIC students of the American scene know that the trend of events in this country has been moving toward a realignment of the social structure. This has been long decreed by the impact of energy and technology and long deferred by political and financial manipulations.

Now we are up to our necks in a total war to the finish to test whether American civilization is fit to survive. After 166 years of national laissez-faire expansion as a Price System economy with its accompanying denial of any positive social direction, we Americans are suddenly faced with the indispensable necessity for the one thing we always spurned in the past.

Up to date, America has been conducting a partial war wherein some citizens enjoy privileges and profit at home while others die on foreign soil. Private enterprise is in control of war production, for a neat consideration, of course, and is largely interested in preparing a favorable postwar position for itself even during the present emergency. Such is the nature of 'free enterprise' but this myopic attitude is hampering the national effort greatly. America cannot possibly attain its maximum of efficiency in the conduct of the war by using the methods of yesterday's successes.

Among the few real shortages existing in America today, the greatest

shortage of all is scarcely even recognized. This is the lack of a unified, overall, National pattern of war operations. Without it we could lose this war. With it, we could never be beaten. The pressure of world events, the capacity of our fascist enemies and the technological nature of modern warfare dictates that American civilization must be mobilized in its entirety and directed according to a scientific design.

Conscription for the Armed Forces alone, while permitting the anarchy of 'free enterprise' in the service of supplies, is not enough. There must be an extension of the principle of conscription. The question is what kind of conscription will we have? Shall it be conscription of labor alone? That is a step toward fascism at home. Shall it be conscription of wealth alone? That is a step toward communism, equally as foreign and repugnant as fascism.

There is a third way, which is compatible with the technological nature of American civilization. This is the TOTAL CONSCRIPTION OF MEN, MACHINES, MATERIEL and MONEY, with NATIONAL SERVICE from ALL and PROFIT to NONE. This is the only real American way to conduct this war and win the peace which will follow.

Total Conscription is Technocracy's Victory Program for America. It is a non-political engineered design of



war operations and calls for an equal and equitable effort from all citizens. It will streamline America for action and liquidate all pro-fascists at home. It will unify and operate the entire system of industrial production at its highest peak of efficiency, produce an abundance of the most efficient mechanisms of war, and at the same time provide a high standard of living for all citizens. Total Conscription will win this war for America without the necessity of selling bonds or levying taxes and without piling up one single additional dollar of war debt to plague future generations. These statements are correct, and this

is the biggest and most important program in America today.

This is a challenge to all intelligent and patriotic citizens. *Technocracy Inc.* calls upon all Americans everywhere to investigate Total Conscription. Every section of *Technocracy Inc.* has qualified speakers available to explain the proposal. Technocracy states that this program deserves your most serious attention. *TOTAL* Conscription of Men, Machines, Material and Money, with National Service from All and Profits to None, is the only unified design in existence that will absolutely guarantee the greater destiny and future of America and all Americans everywhere.

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### **A General Should Know**

'Let the officers and the directors and high powered executives of our armament factories and our steel companies and our munition makers and our shipbuilders, and the manufacturers of all other things that provide profit in wartime, as well as the bankers and the speculators, be conscripted . . . to get \$30 per month, the same as the lads in the trenches get. Let the workers in plants get the same wages . . . all workers, all presidents, all executives, all directors, all managers, all bankers, . . . yes, and all generals and admirals and all officers and all politicians and all government office holders . . . everyone in the nation be paid a total monthly income of not to exceed that paid to the soldiers in the trenches.

'Let all these kings and tycoons and masters of business and all those workers in industry and all our senators and governors and mayors pay half of their monthly \$30 wages to their families and pay war risk insurance and buy liberty bonds. Why shouldn't they? They aren't sleeping in muddy trenches. They aren't hungry. They aren't running any risk of being killed or having their bodies mangled or their minds shattered.' Major General Smedley Butler in *War Is a Racket*.

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A conference is a group of men, who individually can do nothing, but as a group can meet and decide that nothing can be done.

# From The Camera's Eyevew

## Technology Goes To War

### 'There Was The Door To Which I Found No Key'

**I**T HAS been said that man is the only animal that wages war upon his own kind. Whether this is so or not it is a fact that the history of war is as old as the written records of mankind. The Supreme Court of the United States once defined war as 'every contention by force between two nations in external matters, under the authority of their respective governments,' (Bas v. Tingy, 4 Dallas, 37).

In ancient literature we can read the story of Numa Pompilius (714 to 672 B.C.), the second King of Rome. During his reign, he had a shrine built to the pagan God Janus, the God of gates and doors. Pompilius specified that the gates of the temple should be kept open whenever Rome was at war and closed when peace ruled over the city. Existing records show that between 672 B.C. and 14 A.D. the gates were closed only four times, for brief periods. As a matter of record, since 1600 B.C. up to now the world as a whole has experienced less than 330 years of peace.

There is something symbolic in the specification that the shrine of Janus should be open to the people only in time of war. Perhaps it was symbolical of the fact that the 'glory' of war was the only event making escape from the grinding life of toil and scarcity possible to mankind in that day and age. In war the gates of adventure opened wide and men could march off to loot, rape and kill 'under the authority of their respective governments.'

When peace descended again upon the land and the adventurers returned home to the boredom of social conformity, they found the gates to the Temple of Janus closed, symbolizing their reimprisonment within the structure of a social system based on human toil, hand tools and an everlasting hand-to-mouth scarcity.

### War Has A Thousand Doors

Prior to the middle ages and as far back as records indicate wars were waged by professional armies. These armed forces were practically self-sustaining. They fabricated their own weapons and lived off the lands and peoples they conquered. There was no necessity for anything but moral support from the home front. Gradually, however, as new weapons were introduced the problem of supplies became greater in magnitude and complexity. Each new device introduced on the battlefield called for a better one to offset it. The crafts of the armorer and gunsmith became important. Armies grew larger and their food supply necessitated replenishment from the home land.

During the Napoleonic wars 1795-1812, at the beginning of the industrial revolution, one craftsman was required at home to supply every two soldiers in the field. War had always thrown its doors open to adventure, now new factors began to cross its threshold. Technology stepped through in 1795 when Nicholas Appert, a Frenchman, discovered the process of canning food which Napoleon used to help supply his armies.

The American Civil War gave a tremendous boost to industry and technology. By 1870 the service of supplies to armed forces had increased in magnitude to the point where it required one craftsman at home for every soldier in the field. Technology was moving through the open door of war to a greater extent. The first world war 'to save democracy' spurred the rise of aviation. During that holocaust it required five factory workers at home to supply one soldier at the front. The first handwriting by technology appeared upon the wall then, but only a few could read it. In 1944 it is estimated that the labor power of 18 skilled workers at home is necessary to supply and maintain every soldier in the Armed Forces. Of course, there aren't 18 skilled workers for every soldier but there is a magnificent technology with the almost unlimited labor power of America's extraneous energy at its command. This is something our forefathers knew nothing about. Technology is now wedded to the ancient art of war and never the twain shall part. See p. 35.



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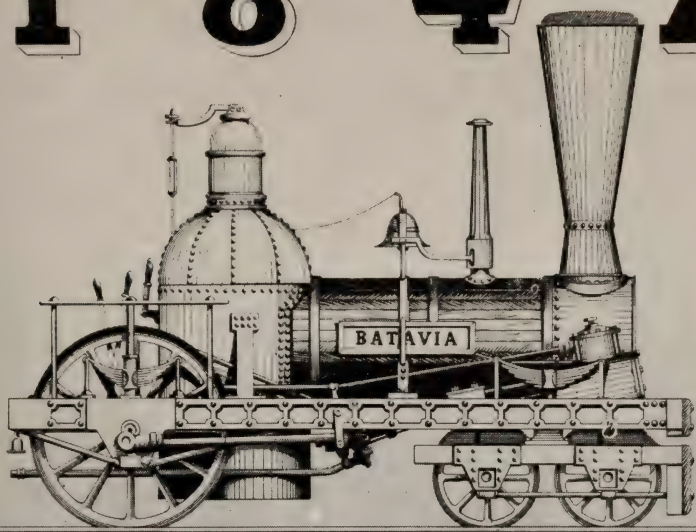


Photo: Courtesy N. Y. Central System

One of the first locomotives built in America. It was completed in 1838 by the Rogers Locomotive and Machine Works, Paterson, N. J., for the Tonawanda Railroad. The form of firebox shown here, semicircular at the rear part with a hemispherical top surmounted by a dome, was used as late as 1857. The Batavia was typical of early railroad technology. It was good enough for grandpappy's time. Today it wouldn't even be capable of switching freight cars around a small town siding. Good old Batavia.



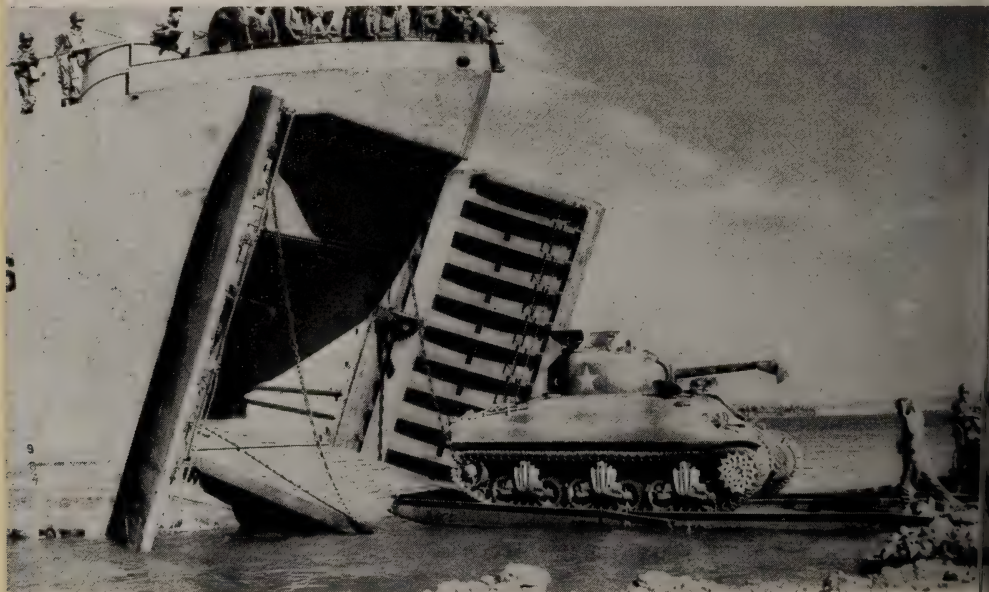
Photo: Courtesy The Pennsylvania Railroad

Here's the latest in railroad technology, two way electronic train telephones, not straight radio. It permits talk at will between locomotive and caboose, between trains miles apart and with distant block operators. The carrier current system is used. The current jumps the distance from rails or wire to the receiver it is intended for. Others are not affected. It was installed recently on a branch of the Pennsylvania R.R. Technology deflates the factors of human error and ego. Hurrah!



Photo: Courtesy United States Rubber Company

oil-resistant synthetic rubber lifesaving suits marching off the production line. To the Merchant Marine they come in mighty handy sometimes. The drawstring closure at the top (head covering not shown), keeps it snug at the neck, leaving only the face exposed. The harness device around the waist is to fit oil covered seaman from the water. Made of one piece they keep the wearers dry. Buoyancy is supplied by a life vest worn underneath. On the land and on the sea, technology hastens victory.



Official U. S. Navy Photograph

war opens the door wide. Here's a closeup view of the LST (landing-ship-tank). This is a beautiful illustration of naval technology. Before the war there was no such a boat as an LST. Neither did some naval designer dream it up overnight to meet the emergency. The necessities of amphibious warfare dictated the LST. The designer must conform to the physical needs and limitations. Will we ever learn to attack social problems with this object lesson in view? The principle is the same.



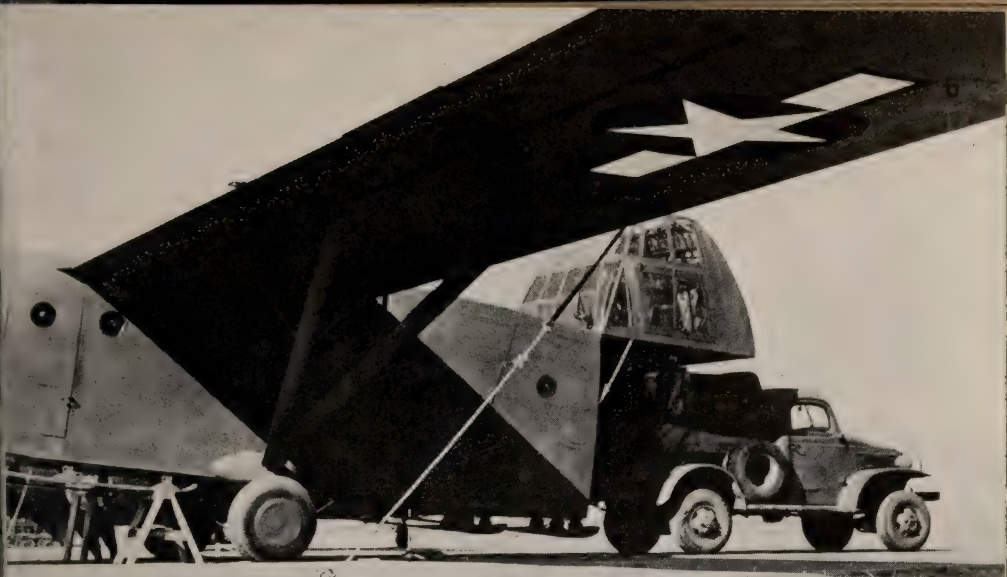


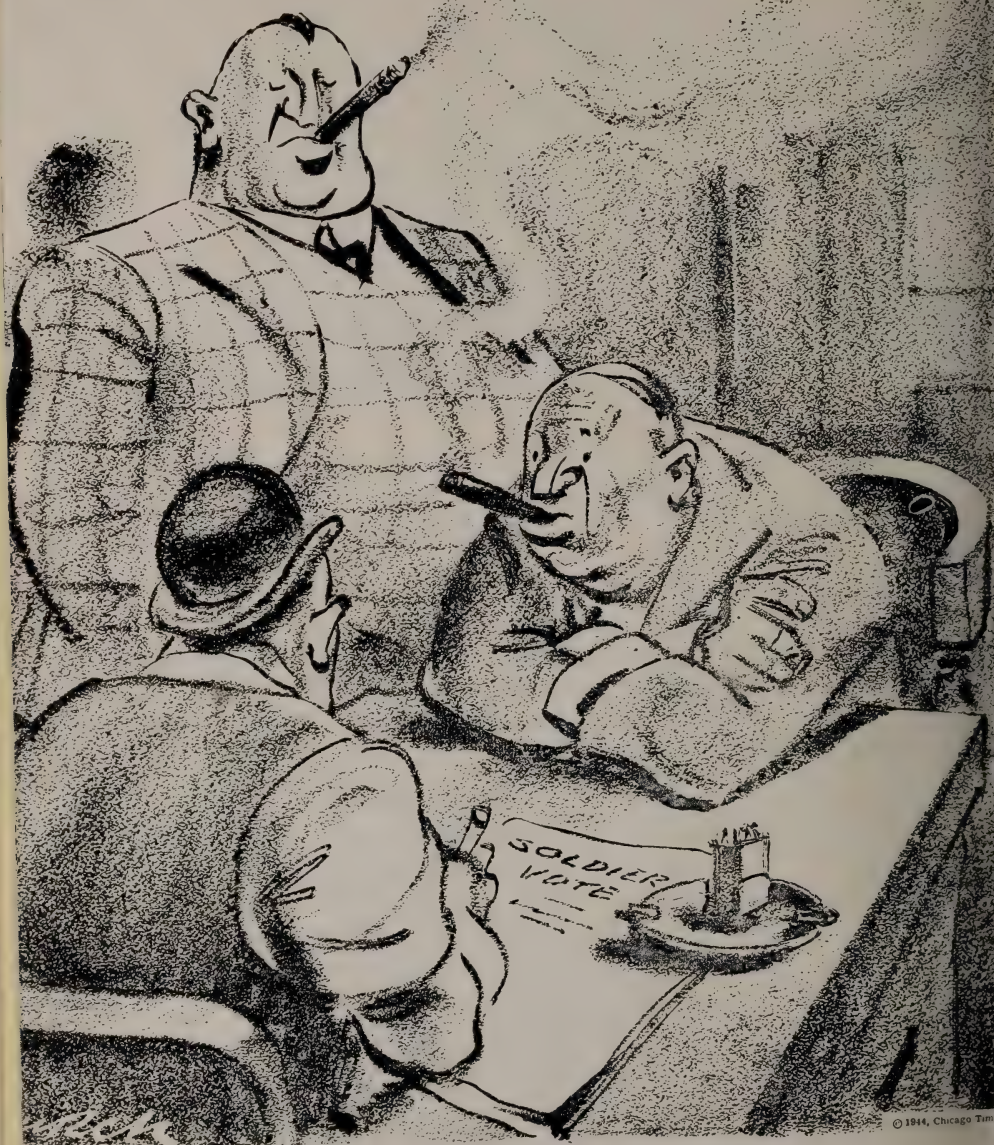
Photo: Courtesy U. S. Army Air Force

Literally riding on the wind. The Army's newest glider YCG-13. It will transport more than 24 infantry men with full packs, mortars and machine guns. Two jeeps with their crews or a medium truck with accompanying equipment may be loaded and unloaded through the nose. The YCG-13 is now in mass production for the Air Force Troop Carrier Command. It weighs about four tons empty, and is built largely of plywood. On the sea and in the air, technology is everywhere. Ubiquitous is the word.



Official Signal Corps Photo

This new Army combat reconnaissance car M8, designed by the Ordnance Department, combines the speed and maneuverability of an automobile with the punch and armored protection of a light tank. The M8 weighs 8 tons and is capable of high speed over rough terrain. It mounts a 37mm cannon and a 30 caliber machine gun. Notice the low silhouette and high ground clearance. The tough front end simply pushes down and rides over underbrush and trees. A crew of four handles the M



*"We know how they fight—but the question is  
how will they vote?"*

Photo: Courtesy The Chicago Times Syndicate

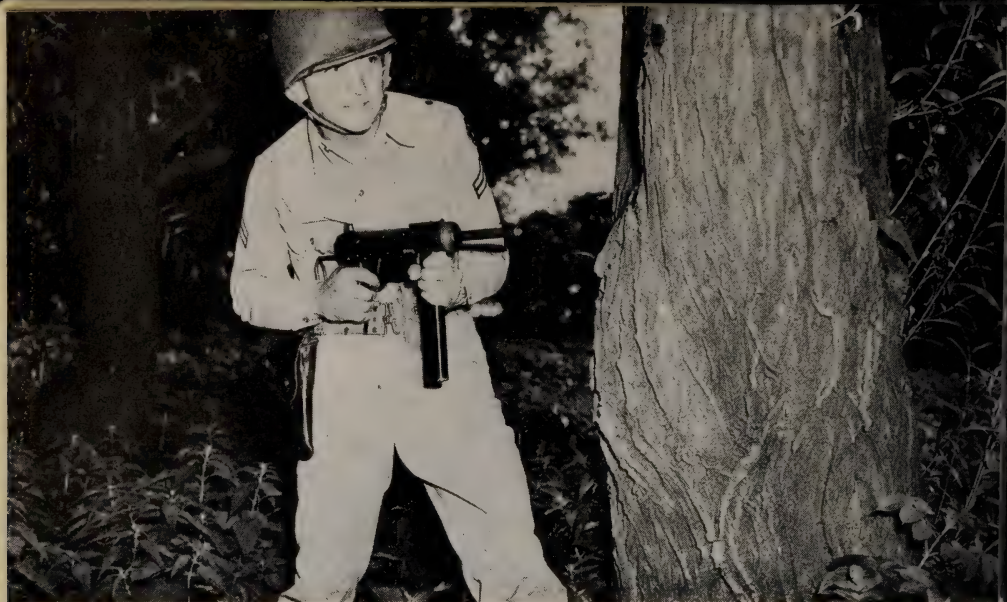


ONE VOTE THEY WON'T HAVE TO WORRY ABOUT



Photo: Courtesy The Nashville Tennes'





Official Signal Corps Photo

The U.S. Army adopts 9-lb. 'baby.' The M3 submachine gun takes .45 caliber pistol ammunition, holds 30 rounds and fires either one shot at a time or at the rate of 450 a minute. Fabricated mainly from stamped metal and screw machine parts no tools are needed to take it apart. It is completely enclosed, mud-proof and has no external moving parts. The stock is the ramrod also. The M3 is used as a pistol or shoulder gun. After 49,600 rounds of test firing its accuracy improved. Some baby!



Official Signal Corps Photo

Indian fighting has its place in war too. American soldiers are taught to take advantage of every bit of natural concealment such as bushes, tall grass, trees, rocks and breaks in the terrain. When camouflage of the person is used also the resulting picture is likely to be very misleading. There are at least 29 soldiers concealed in this picture. How many can you see? Don't strain your bifocals trying to find them. Take the Army's word for it. Camouflage is the technology of concealment.





U. S. D. A. Phot

Carry me back to—what? Human toil and hand tools? Here the hands are the tools. Cotton is the largest employer of agricultural labor. Up until recently King Cotton has defied mechanization. Cotton picking is the greatest single source of women and child labor in America. There are about 9 million people in the 2 million tenant families of the 10 cotton states. Their lot is largely spent in raising and picking cotton. It's a tough life, but technology is making it easier. Oh Happy Day!



Photo: Courtesy International Harvester Company

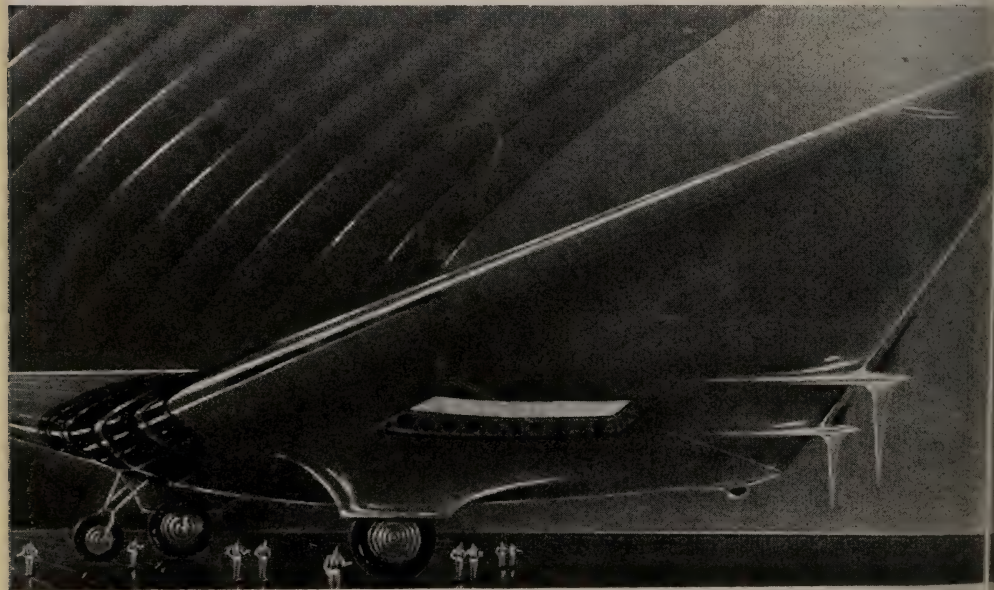
This mechanical cotton picker will pick as much cotton in one day as 70 men. At present wage rate it costs about \$30.00 to pick a 500 lb. bale of cotton. This machine cuts that cost to about \$1.00 a bale. Figuring overhead, amortization, depreciation and downgrading caused by dirty cotton the saving is at least \$20.00 a bale. 'Weep no more my lady—.' You will soon be released from the bondage of toil and scarcity. Politics can't do it; but technology is making it a categorical imperative.





Photo: Courtesy General Electric Company

Only 1/15th the size and weight of the average 3 hp. motor this mighty 7 lb. midget develops the same horsepower. It operates at 120,000 rpm, 2000 every second. This is 65 times the speed of the average 3 hp. motor, or  $13\frac{1}{2}$  times the speed of sound. It is water cooled, consuming  $\frac{1}{2}$  gallon per minute. Oil-mist lubrication type bearings are used. If automobile wheels could turn at the same speed, cars could travel 10,000 miles per hour or 165 miles a minute. Wow! What's Next?



Design Patented by Jacques Fresco

This is an original design depicting a huge Flying Wing of 70 tons capacity. It will probably be of the pusher type, using dual rotation propellers or jet propulsion. The undercarriage and power plant are housed within the aerodynamically designed wing. Flying Wings derive stability by means of a 'washout' arrangement. The wing tips have a slight degree of twist downward. Turning is effected by the ailerons. Trans-Pacific warfare demands long range Flying Wings. What are we waiting for?



## **'Am I My Brother's Keeper?'**

*Continued from page 26*

Old King Pompilius could not have foreseen that the warfare of small self-sustaining armies would become the total, technological war of today wherein the entire home front has become an integral part of the war organization. He viewed the world around him within the framework of the simple handicraft-agrarian culture of his time. This is the best that can be expected of any man, that he view the problems of his day within the context of events current at the time.

Today the framework of a high energy civilization is evident on all sides. Warfare, now, is waged with the tools of social change. By this we mean that the processes and mechanisms introduced during the war have a terrific impact upon the social structure when it contracts into a state of peace. The factors of social change grow steadily more portentous. And, what is the social picture today? Nearly all our 'best minds,' our 'statesmen,' our 'tycoons' of industry, our 'leaders' in education and the professions and all the 'respectable' and 'nice' people of the 'better classes' are sound asleep. They view the social problems of today within the context of events that occurred a thousand years ago.

### **Business First**

Price System methods set up a preferential distinction between industrial production on the home front and National Service in the Armed Forces. Industrial production of war is regulated by merchandising practices and consecrated to private profit, in spite of the fact that this production is an integral part of the hostilities which are publicly conducted and publicly borne. A thousand years ago it was not necessary for the people at home to give anything but moral support to their kinfolk who had gone off to war. Today, technological war calls for a complete coordination between the entire industrial machine and all military operations. There must be topnotch efficiency all around and equality of effort and sacrifice. The highest morale stems out of a common objective.

Oh, yes! We will win this war. There has never been any doubt about that. But the war will not be won because of the \$8,500,000,000 of corporate net profit made in 1943; it will not be won because of the \$2,130,000,000 spent on advertising in 1943; it will not be won because of the illicit billions raked in on the black market; it will not be won because of the 1,900,000 workers who laid down their tools in the 3,750 strikes in 1943 for 1/7th of one percent of the total time worked; it will not be won because of the juvenile delinquency mushrooming in every town and city; no, it will not be won because of any part of the nature and characteristics of the Price System, but in spite of all these. American technology and fortitude will bring home the bacon. There has never been any doubt about that.

### **'—No Less Renown'd Than War'**

But, after every war comes a peace. Then, symbolically, the gates of Janus swing closed. Then, soldiers return home, war industries close, war workers cease working at war work. Then, private enterprise must, perforce, return to its time-tried rackets. Then, it will again have the freedom it is forever bellyaching about to demonstrate for the umpteenth time its functional incompetence to distribute an abundance. Then, all the human components of the land will be reimprisoned within the stifling framework of a social system, dependent on technology and extraneous energy, but operated by handicraft-agrarian methods handed down from the time of old King Pompilius. When peace again descends upon this fair land, the impact of technology will be reversed, like a boomerang, from the open door of war, and directed with shattering force upon the social structure at home. The compulsion for social change will descend upon America with cataclysmic certainty.

As sure as the sun will rise above the eastern horizon tomorrow morning, the trend of physical events instituted by science and technology, its pace and power accelerated by war, will proceed inflexibly to its rendezvous with this generation of Americans. There is no escape for us from that fact. Total war will either be followed by total peace or social disintegration. The signs all point in one direction. The tools of social change are sharp and they cut in both directions. America must be prepared with a program in harmony with the trend of events.

# Now We're Burning The Air

Story of Jet Propulsion Planes

by Pvt. Arland R. Meade

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Rocket motors, gas turbines and jet propulsion planes have been much in the news lately. They are all related to each other and they are all prime movers. Any machine that makes the initial conversion of energy into work, or motion, is a prime mover. There are only a few prime movers in existence, all told, and this sudden addition to their number is highly significant. Two of these, the gas turbine and the jet propulsion engine, are sure to replace less efficient prime movers. Here's the story of the Jay-Pee up to date.

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## *The Greeks Had A Word For It*

EVERY American child who has seen a fourth of July rocket streak into the sky or the sudden burst of motion of a free balloon rapidly losing its air through its stem has seen the form of propulsion of the much discussed jet-propelled airplane. The rocket, the deflating balloon and the jet-propelled airplane all move because of the thrust developed by a mass of swiftly moving air or gas against the surrounding atmosphere.

The propulsive power of a jet has long been known—for more than 2000 years, at the very least. The principle was demonstrated in 150 B.C. by Hero of Alexandria in the Temple of Serapis at Athens. The original jet-propulsion machine was called an Aeolipile.

The Aeolipile was basically a small globe supported above a boiler on two trunnions. Steam from the boiler entered the globe under pressure through one of the supporting trunnions and made its exit through two nozzles on opposite sides of the

globe. As the steam escaped through the nozzles against the atmosphere, a thrust was developed that caused the globe to spin on its axis. The Aeolipile was the first steam engine, centuries before the invention of the reciprocating type and the steam turbine.

The principle is old; the practical use is so new that it is not quite here yet, except in nature. The squids, a group of marine invertebrates, closely related to the octopus and the clam, move by jet propulsion. Squids vary in length from a few inches to several feet. In general they have streamlined, tapering bodies with a small head surrounded by tentacles. The squid sucks water through an opening near the head into a mantle cavity surrounding the body. Then with powerful muscles the squid compresses the mantle, ejecting the water through a jet with propulsive force, sending itself through the water in a darting movement.

## *Hero's Idea Exhumed*

About 18 centuries after Hero built



his jet-propelled steam engine, Sir Isaac Newton experimented with a jet-propelled carriage. In this case the carriage consisted chiefly of a large boiler with one cannon-like jet at the rear.

The birth of aviation in the 20th century brought a revival of interest in jet propulsion, yet while the planes using a propeller became more and more efficient and versatile, the experiments with jet propulsion led to a series of failures.

For instance, in 1908 a French inventor named Lorin proposed using a reciprocating engine as a jet device by allowing the exploding gases to escape from the cylinders through funnel-shaped outlets instead of driving pistons on a crankshaft. This arrangement combined both the disadvantages of the reciprocating engine and the jet type. It was a total failure.

Another Frenchman, Morize, in 1917 suggested the three basic parts now found in any jet propulsion unit: An air compressor, a combustion chamber, and an expansion chamber with a nozzle outlet. Morize introduced an air intake at the forward end of the apparatus for taking in the air for subsequent compression and combustion.

That step marked the major difference between a jet-propulsion device and a rocket-propulsion device. The propulsion itself is the same for both, but the sources and development of the propulsive reaction differs—and here enters the story of combustion and energy.

### *A Rocket Is a Chemical Reaction*

The rocket contains within itself all the fuel (the energy source) plus all the oxygen for the combustion of the fuel. Discarding the powder combustion rocket as of small use, although airplanes have flown by such propulsion, we find the most suitable fuel for rockets to be the liquid hydrocarbons, as gasolene, kerosene or alcohol. The fuel and liquid oxygen are fed together into a simple combustion chamber and ignited. The resulting gases pass at high speed out a nozzle or several nozzles, pointing toward the rear. The impact of these gases against the atmosphere provides the thrust that moves the rocket. The combustion in the chamber is continuous until the flow of fuel ceases.

The device now referred to as 'jet-propelled' differs from the rocket in that it does not carry its own supply of oxygen for the combustion. The fuels can be the same, as can be the exhaust outlets, but there are greater possibilities of range and pay load because the oxygen is taken from the surrounding atmosphere.

In structure, the jet propulsion device is more complicated than the rocket, but both are extremely simple compared to the conventional internal combustion, propeller-driven plane. The rocket has no moving parts at all, and the jet-driven plane has only two: A rotary blower to compress the air taken in near the front of the fuselage, and a gas turbine which uses some of the products of the combustion.

tion chamber as the power source for the operation of the compressor before allowing the gases to escape rearward to the jet.

The jet-propelled airplane, which was developed chiefly from the experiments of Captain Frank Whittle, R.A.F., best demonstrates the most successful type produced so far. It was first flown in Britain in May 1941.

### *Jet Propulsion Is a Machine*

Basically, the mechanism is as follows: Air is scooped into the plane near the front of the fuselage through one or more large funnel-like openings. This intake may be directly at the nose of the plane or through open-front 'blisters' at the sides of the fuselage. The intruding air is sucked into a rotary impeller, which compresses the air and forces it into a helical combustion chamber where it is combined with fuel by an injector. In the same chamber the continuous combustion takes place. The expanding gases pass through a gas turbine which drives the impeller-compressor before escaping rearward to furnish the propulsion. Therefore, part of the energy is used in operating the compressor.

It is possible, as in the Caproni-Campini plane, which was flown in Italy, to use an internal combustion engine to operate the compressor. This, however, added so much weight and bulk to the apparatus that there was little capacity for pay load. Having the impeller driven by a gas turbine is simplicity itself, for the tur-

bine and the impeller may be operated on the same shaft in a continuous motion with a minimum of moving parts. This is the same arrangement found in the turbo-supercharger, in which the engine exhaust gas operates the turbine.

The remaining structural part is the exhaust nozzle. This must be large enough to allow the passage of sufficient mass of air to produce enough thrust to propel the plane. In principle this is the same as the function of the propeller, but with different velocities and masses. The thrust produced by the propeller is due to the scooping of large volumes of air and forcing them backward at greatly increased velocity. Typically, the jet propelled planes send a much smaller mass of air backward at a much greater velocity. The thrust of the jet can be calculated from the mass of air moved per second and the increase of velocity of the air, that is, the difference between the air speed of the jet and of the air being sucked into the mechanism. Small diameter jets do not produce a worthwhile thrust even at very high velocities due to insufficient mass of air moved.

The mass in the jet can be increased by use of augmentors placed around the exhaust nozzle. These augmentors are simply Venturi-shaped rings, used to suck in additional air to add to the mass of the jet.

Because of the simplicity of mechanical design, an analysis of the function of the entire apparatus can be made on a few principles of



physics. The first that may be considered is Newton's law that action and reaction are equal and opposite. Obviously then, enough mass of air must be forced out the nozzle to give enough thrust against the atmosphere to provide opposite thrust enough to propel the plane forward. The rate of fuel used for combustion must be great enough to provide a large volume of combustion products, i.e., gases to provide the thrust. That such a thrust can be developed is proved conclusively by the speed of the Bell Interceptor Fighter which has been flown in this country between 500 and 600 miles per hour, using two jet engines. This is about 100 miles faster than level flying speed of any other type of airplane.

#### *Enter Thermodynamics*

The efficiency of fuel use is the second major factor. In order for the jet-propelled craft to compete with propeller driven types, an approximate equality, at least, in efficiency of fuel use is imperative.

At first hand it appears that such is not the case. Alexander Klemin, writing in *'Scientific American'* April 1944, states:

... the fuel consumption per horsepower hour is far too great for the engine to be used in bombers or any craft, for that matter, in which sustained operation may be required.

He refers to the net results of fuel use in terms of movement, not in terms of efficiency of combustion. There are two types of efficiency to be consid-

ered in an engine designed for aircraft use: Thermodynamic or internal efficiency and propulsive or external efficiency. The former is the ratio of the power developed to the total energy in the fuel.

The thermodynamic efficiency of the jet propulsion engine is much higher than that for the internal combustion engine. Combustion can be complete. Chemical losses are eliminated and with a long exit nozzle, much of the heat energy is converted to kinetic, thereby reducing exhaust losses. Internal efficiency of the jet propulsion engine has been estimated up to 70 percent by German writers.

This internal efficiency is approximately double that of the best internal-combustion engine (the Diesel) which has chemical losses from incomplete combustion, bad mixing of gases, loss of fuel through exhaust, cooling losses through the walls, and mechanical losses.

#### *The Competitive Factor*

On the basis of propulsive or external efficiency, the situation is reversed with the jet propelled craft being much the less efficient. The efficiency of a controllable pitch propeller may be as high as 85 percent with the efficiency of the jet at an estimated 10 percent. This is true because the gases come out too fast, thereby carrying away too much of the energy of combustion.

There are two methods of increasing the external efficiency of the jet. First, great quantities of air can be mixed with the air in the jet to decrease the velocity and increase the

mass. The second is to design the apparatus to travel at extremely high speeds. As the speed of the plane increases, the jet-type power plant increases in efficiency while the propeller-type decreases. Higher speeds are possible in the stratosphere, indicating that the future of jet-propelled aircraft is far above the clouds.

There are two functional factors causing the increased efficiencies at high altitudes, with special advantages over the propeller driven plane. A propeller in rarefied air loses a great deal of its efficiency due to reduction of the air-stream mass moved by the propeller. Due to the function of the compressor, this effect is minimized in the jet operation. Secondly, there is an additional advantage due to the great expansion of effluent gases in free air. That the efficiency of the plane increases with higher speeds can be shown by using the formula for propeller efficiency:

$$E = \frac{2v}{V + V'}$$

Where E is efficiency, V is the velocity of the plane and V' is the velocity of the jet.

Using a speed of 300 miles per hour for the plane and 1500 mph for the jet, we find:

$$E = \frac{600}{1800} = 33.3 \text{ percent efficiency}$$

With a speed increased to 600 mph we find:

$$E = \frac{1200}{2100} = 57 \text{ percent efficiency}$$

That a speed of 600 miles per hour

with such a plane is within reach was amply demonstrated by Major General William E. Kepner of the 8th Air Force and test pilot Robert M. Stanley, former national glider champion, in flights made in a plane developed by Bell Aircraft and General Electric based on designs of Wing Commander Frank Whittle of the R.A.F. In the twin-jet plane (resembling the P-38) the pilots flew to a top speed of between 500 and 600 miles per hour, according to the London *Daily Mail*. Military censorship will not permit the release of exact figures. It was on October 1, 1942, that the first successful flight in America was made.

While comparable speeds have been made in power dives with propeller-driven ships, in ordinary flight the present-day propeller-driven plane begins to be stymied by the effects of compressibility at speeds much above 450 miles an hour. At these high speeds there is a rapid falling off in the efficiency of the propeller.

When we look at the present displacement of the jet-propelled airplane in general, it is not over-optimistic to say that it makes air travel possible at speeds far greater than with conventional planes. That much is certain. Without doubt, the jet motors can be adapted to the aerodynamic superiority of the Flying Wing, which is the design of the future—the very near future, if engineers were permitted to build the best regardless of whose financial toes got stepped on.



## *Vinegar For Stockholders*

A summary of pros and cons to jet propulsion airplanes would read as follows:

Among the cons would be: (1) very low external or propulsive efficiency, (2) high fuel consumption per horsepower hour, (3) difficulty in securing enough mass of air and gas for an efficient jet, (4) excessive use of space by the apparatus within the plane (although simple it is bulky) and (5) generation of high heat in the combustion chamber which may be dangerous at times. The main drawback is still simply the efficient use of the fuel.

The list of pros is longer. They include: (1) extreme simplicity of the engine, with only two moving parts in place of hundreds, (2) tremendous speed, especially at high altitudes, (3) lack of noise and vibration due to the fact that all moving parts are rotary, (4) reduction of pilot fatigue due to quietness of the cockpit and absence of vibration, (5) better vision because no propeller, motors or other equipment need be in front of the cockpit, (6) utilization of many kinds of low grade fuel, (7) high internal or thermodynamic efficiency, (8) absence of many losses of the reciprocal engine, such as mechanical, exhaust, cooling, etc., (9)

elimination of high gear and complicated retractive mechanisms now used to keep propellers from contact with the ground, and (10) possibilities of building the functional parts of the apparatus into the structural part, making greatly increased space for pay load. To this it may be added that the jet plane will play hob with the skill of pilots. It is simpler to fly and many of the propeller-type airplane's instruments will not be needed. The Jay-Pee dispenses with more than a dozen gasoline-engine controls. Technological displacement of skill is at work in aviation also.

Whatever the status of the jet-propelled plane as this article is being written, be assured that it will be different tomorrow. Technology is dynamic. The rate of technological change is in a period of rapid acceleration. All major nations, including our fascist enemies, have built and flown such planes. For the safety of America, it is imperative that no nation surpass us in scientific development. On that count we have little to worry about.

On the other hand from a social consequence point of view there is a great deal to worry about with regard to America's advancement in science and technology. But that's another story.

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'Dollar value (of airplane freight) is relatively unimportant in wartime. Recently we turned down an application for priority to import by air a small amount of luxury material worth \$1,500 a pound, and we are

now giving top priority to large amounts of strategic raw materials worth less than 5 cents a pound.' Lt. Langdon P. Marvin, of WPB air-cargo priorities committee. (*Chicago Daily News*, 2/26/44.)

# Add Two and Deduct Three

Prosperity In Reverse

by Charles J. Loignon

*'Parting Is Such Sweet Sorrow'*

**P**OLITICAL and technological trends have come to the parting of the ways. While politics still pursues the infantile course of crying and stamping its feet when it reaches a closed gate, technology has graduated from the school of science and is solving the productive problems of society in spite of organized opposition. Technology is veering away from its opposition and graphically is turning up its nose at the stumbling, plodding, obstructionist course of politics.

Political hysteria is especially evident in the vague postwar plans which are rendered obsolete by technology even before the ink dries on the print.

Postwar plan #000AC1,389,674, B.C. is now rendered obsolete by Baruch's master plan. The expressed aim of Bernard M. Baruch and John M. Hancock, White House advisers and veterans of industrial mobilization in both world wars, is to avoid economic chaos in a period of readjustment from war to peace and to create instead an 'adventure in prosperity.'

They say there is 'no need for a postwar depression. Handled with competence, our adjustment after the war is won should be an adventure in prosperity. Finally, while the pro-

ducers should be restrained from excessive profits during the war, the workers as long as hostilities are on should refrain from strikes. No grievance, however just, should be permitted to slow our march to victory.'

From the beginning of history politics and confusion were bed partners, so where can one see the miracle of competence in politics? The disastrous adventures of politics are too numerous to entice many followers. Unless 'producers' and 'excessive profits' are defined and clarified, any political action in our present code of conduct will suit the interested parties. Moreover, if these restrictions are intended only for the duration of hostilities, then the postwar period promises to be the greatest free-for-all scramble for profits and existence—no holds barred.

*To Chisel or Not To Chisel*

After the war Uncle Sam is urged to 'get out of business' and create two offices: One a 'war director' to deal with demobilized war veterans and war factory workers; the other a 'surplus property administrator' with full authority to dispose of the Government's billions of dollars' worth of war materiel from factories to airplanes.

American citizens not in defense plants or in military service are due



for a shock. If the promises of politicians materialize in the postwar period, the average citizen will be left out in the cold in a mad scramble for jobs. Soldiers and defense workers shall have preference. Lo! The poor civilian! Maybe they can all turn chiseler, like the following two cases:

Recently, 80,000 batteries were released as salvage material in the Ninth Service Command comprising Ogden, Utah. James H. Harberton, Ogden mortician, and his brother Jack Harberton bought half of those batteries for \$80 and resold for \$20,000. Warren Grothe Bountiful bought the other half for \$50 and resold for \$7,200. The OPA found no violation of price ceiling regulations and the buyers did not believe their profits excessive.

The field seems to be wide open in soup plates too. The Army soup plate (identified as 63-C 3255) is a standard, indispensable article. Last Spring the Army found a surplus of 50,000 soup plates in its inventory. Following regulations, inquiry was made whether any other Government department could use them. The answer was no, so Army officials sold the soup plates for 12½ cents a piece. Some time later Army officials (whether the same or others, the record does not say) ordered another 30,000 of the same soup plates at 17.8 cents a piece. A little bit after this they discovered another surplus of 187,000 soup plates. After more routine inquiries, these were sold for 9 cents a piece. In December, the Navy ordered 110,000 soup plates.

Presumably, the soup plate business is still flourishing.

### *Don't Tell Me That Old, Old Story*

While the service men struggle in jungle mud against insects, reptiles, beasts, disease and a cunning vicious enemy, their civilian obligations are frozen. If and when they return, they will find a declining labor market and a contracting wage. Simultaneously, the drop in prices will increase the value of the dollar. Against these odds, these crippled, sick and exhausted men will be expected to renew their struggle, not only to meet their frozen obligation with 'bigger' dollars and reduced wages, but to catch up with those who got a head start up the financial ladder while they were fighting—for what?

While technology is constantly reducing the man-hours per unit of production, the mounting production record made possible by the availability and use of ever greater amounts of extraneous energy point out the direction of physical trends. In spite of the cost-plus system, the inevitable consequence spells a reduction of total man-hours.

While production is important, the time and place of delivery are just as important. The attempt to lure a large segment of our population into 'victory gardens' and back to the primitive hand methods, while the same effort would produce equipment that would multiply their composite results a hundredfold, is sheer nonsense. Likewise, the great number of people employed by Uncle Sam for

the purpose of restricting production by controlling price, such as the AAA and the OPA, if put to productive work would enlarge our less bountiful commodities to such an extent that it would remove the necessity for their existence. While technology to producers means greater capacity at a reduced cost per unit, to employees, it means a red light to their services.

When did American private enterprise become so imbued with philanthropy that it is willing to feed every savage on the globe while it

fits the American people with a strait jacket? Is America going to try to maintain a financial and political system which is incompatible with physical capacity, or is it going to adapt itself to physical trends?

Technocracy is urging Total Conscription of Men, Machines, Materiel and Money as the only means of utilizing our full capacity of production in order to assure victory and a high standard of living, without favoritism or drudgery. How about getting that urge yourself?

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### **Bring Your Charts Up To Date**

America's industrial production is the basis for the munitions of war as well as the materials of peacetime, as Europe and Asia's fascist nations are learning the hard way. That being true, the charts in Technocracy's Study Course, of basic trends, hold as much meaning now as when the book was first printed. To bring some of the charts up-to-date, as well as to indicate some other data, here are official 1943 production figures:

Pig Iron.....60,900,000 tons  
 Railway Freight..725,000,000,000 ton-miles  
 Railway Mileage.....230,000 miles  
 Total Coal Mined.....649,000,000 tons

All these are all-time output records except for railway mileage, which is a new low!

Other 1943 units of production from American mines and factories are:

Oil .....1,503,000,000 barrels  
 Natural Gas...3,369,000,000,000 cubic feet

Aluminum .....920,000 tons  
 Magnesium .....185,000 tons  
 Steel .....89,000,000 tons  
 Copper .....1,087,000 tons  
 Nickel (Canada) .....265,000,000 lbs.  
 Plastics .....750,000,000 lbs.

Our steel output compared to our enemy's production, is 70 percent greater. And in oil the entire North American Technate Area produced 1,765,200,000 barrels last year to Germany-Japan-Rumania-Netherland East Indies' grand total of 67,000,000 barrels! Of course, they produced 5 or 10 times that much synthetically, but we *still* have most of the production.

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**An article on Canada's modern technology which was to have appeared in this issue came in too late for inclusion. It will be in the next issue.**

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# Preamble to Total Conscription

by Olga Sawyer

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**'We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America.'**

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## *We Hold These Facts to Be self-Evident*

**I**N order to form a more perfect union, we must first of all have national unity. That means one patriotism, one objective, one direction. Today that means winning the war. National unity demands the merging of all divisionistic elements into the national economy as a whole.

To establish justice requires National Service from All and Profits to None. Justice is only a mawkish mirage as long as some Americans get rich through war profits, war wages and war racketeering, while other Americans spill their blood in defense of the country.

To insure domestic tranquility, all citizens must serve on the same basis of pay as the Armed Forces, with the same standards of food, clothing and health protection and the same allowances for all dependents regardless of rank or social position. When the needs of the people are adequately provided for, domestic tranquility will ensue.

To provide for the common defense permanently calls for a three-year Continental Defense Training program for both males and females

from 18 to 21 years of age. It requires a fully equipped Armed Force of 1,000,000 engineer-mechanic-soldiers; an Air Force of at least 50,000 Flying Wing Super-Bombers, plus other planes. It also calls for an adequate, modern two-ocean navy. Finally, there must be a fortifications system extending to the outlying islands of the Atlantic and Pacific Oceans and reaching from the North Pole to the northern rim of South America. Each branch of Continental Defense shall have a separate command over its particular function. The entire military, naval, air force and fortifications commands shall be under the supervision of a General Staff, with the Constitutional Commander-in-Chief in supreme command.

We can promote the General Welfare only when we take the 'pay' out of patriotism, and put love of country above politics, profit and the preferential advantage of ourselves or any minority groups.

To secure the blessings of liberty for ourselves and our posterity requires the 'quick freezing' and Total Conscription of all Men, Machines, Materiel and Money into National

Service for the duration and six months thereafter. Otherwise our children's children's children will be shackled to a mountain of debt so high and so burdensome that they will never have the faintest glimmer of what the blessings of liberty mean.

The dollar bill in front of the eyes

of the American people has obscured their vision for four generations. When that has been completely removed and Technocracy's Victory Program put into effect, then, for the first time, will the statements in the Preamble to the Constitution have been both *ordained* and *established*.

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### Offsprings Of 'Free' Enterprise

An area of cropland, equal in size to the States of Maine and New York (50,000,000 acres) has been 'ruined for any further cultivation' by erosion. 'Today it is producing no food for the war and tomorrow it will produce no food for the peace.' The ruined area equals 'at least one-eighth of our total present cropland. That is not all. Erosion has almost ruined another 50,000,000 acres of cropland. Just about all the topsoil is gone from this land and it is riddled by gullies. Still another 100,000,000 acres of cropland have lost more than half of their productive topsoil. And on yet another 100,000,000 acres of cropland, the erosion process is under way. In short, erosion has already damaged more than two-fifths of all the cropland in the United States.'—Extracts from a talk by Secretary of Agriculture Claude R. Wickard before the Rotary District Conference at Reading, Pa., April 17, 1944.

#### *Note to the above:*

Why wasn't the erosion process at work in America before the white man came? After all, the North American Continent had been here for millions of years prior to that. There was plenty of time for all of America's topsoil to be washed away and the subsoil too. You dig out the answer to that question yourself and you'll have the solution to the problem. We'll give you one hint. The Soil Conservation Service is putting up a gallant fight for the conservation of America's number one resource. But it is playing against a marked deck.

In a letter to Marvin Jones, chairman of the War Foods Administration in Washington, Charles C. Lockwood, of the Greater Detroit Consumers Council, charged that Detroit produce dealers are burning carload lots of fruits and vegetables so as to keep prices high. 'Greed for exorbitant profits is making a racket out of food handling,' he said. He pointed out that 50 carloads of potatoes as well as carloads of onions, radishes, grapefruit and oranges have been burned in City incinerators. The situation was investigated by a reporter for the *Detroit Free Press* who questioned workers at the incinerator. They confirmed the story and said that many of them took potatoes and onions home to their families 'because they were perfectly good to eat.' The letter pointed out that housewives are constantly besieged by the WFA to save food—waste nothing—plant victory gardens—food will win the war, etc. At the same time, he charged, 'truck after truck with monotonous regularity pulls up at this one incinerator and dumps its enormous load of vital food products into the flames and not a single government agency seems concerned. The large scale wastage of vital food that is now taking place all over this country is a shocking indictment of our present distribution setup and of those Government agencies which have control of that setup.' From *Detroit Free Press*, April 14, 1944.



# A Primer of Technocracy

## What Is Science?

by Education Division 8741-1

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In the first three articles of this series, we outlined some of the elementary principles of Technocracy. In the progression of mankind from the savage state to the type of civilization we have today, extraneous energy has played a fundamental role. Its part in social life is becoming more important every year. America is in the Power Age. In order to understand and solve social problems today, it is necessary to be scientific about it. The political and moral approach antedate the rise of science and technology; consequently, they are inadequate.

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### *Characteristics of Science*

**D**URING his 7000 years of recorded history, man has acquired a large and growing body of knowledge. Some of this knowledge is empirical, that is, acquired at first hand from practical experience. Some of it is scientific, that is, derived from deliberate investigation. That body of knowledge referred to as scientific is exact, organized and verifiable. Besides these two kinds of knowledge, which are really only one, except for convenience of education, man also has acquired an amazing array of abstract concepts of a philosophical nature. These concepts cannot be recognized as knowledge at all, for they are neither empirical nor scientific. Proceeding as they do from that illusory dream world of the inner consciousness, they are subjective interpretations of imaginary things, not existing anywhere in the physical universe. That fact, of course, does not stop their conception or promulgation. Neither

is it socially desirable nor necessary that this be accomplished. However, it is necessary to be able to distinguish between fact and fable.

Fortunately, we have a yardstick for this purpose. When any concept cannot be measured because the thing or event meant by it, or to which it refers, cannot be found in the external world, it is pure conjecture. Such concepts are correctly defined as opinions. Since opinions cannot be measured, they are all equally invalid in the solution of problems of a physical world. The field of scientific knowledge is confined to the bedrock of measurable reality. Beyond lies the shifting ground of conjecture and opinions. This is the domain of metaphysics. In addition to dealing only with that which is measurable, scientific knowledge is objective and impersonal. Like the genii of Aladdin's lamp, it executes the bidding of its possessor. Science is anybody's servant.

Science can be defined as threefold,

that is, static, potential and dynamic. Statically, it is a verifiable body of classified knowledge. Potentially, it is a set of deduced conclusions and induced principles elaborated from this knowledge. Dynamically, science is the application of these conclusions and principles to the problems of a physical world, so as to indicate solutions to problems at hand and point out the most probable results that may be expected from any set of conditions. In effect, this means the next most probable state of development of anything. So, it can be said that science, as a whole, is *the methodology for the determination of the most probable*.

### *Methods of Science*

Concurrently with the acquisition of knowledge, man developed the scientific method for the extension and application of this knowledge. It has a well-defined technique, consist-

ing of three steps that arise out of the threefold nature of science itself. These may be called analysis, synthesis and operations. The analysis is the collection, verification and organization of facts by means of observation, research and experiment. This establishes the verifiable body of classified knowledge which is the static side of science. The synthesis interprets all inter-related factors and by deduction and induction yields conclusions and principles which make up the potential part of science. The operations step is the application of conclusions and principles on the basis of probability. This is the dynamic side of science. Hypothesis, induction and deduction are used in all steps of the scientific method, in strict accord with the facts. The threefold scientific method is a part of the threefold nature of science.

NEXT ISSUE: What is Technocracy?

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### ***It's Time To Put On Long Pants***

'At the present time our technology has outgrown our social system; the great forces of the Power Age are straining within the confines of institutions that were fashioned in stage coach days. The great wars of the 20th Century are expressions of this cultural conflict, and are chiefly significant for one reason; they are the means by which an old order is to be scrapped and a new one brought into being.'—Prof. Leslie A. White, U. of Michigan anthropologist in *Science News Letter*, December 25, 1943.

'We live in a revolutionary century. All over the world, men are groping toward the high plateau of material abundance which has been opened to them by the achievements of modern technology.' Excerpt from an editorial in *Chicago Sun*, 3/6/44.

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Human inertia is that state of metabolism wherein the iron in the system changes to lead in the seat of the pants.

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A co-ordinator is a man who brings organized chaos out of regimented confusion.



# Technology Marches On

'Uralloy' Throws Its Hat In The Ring

by Research Division 8741-1

*Wouldn't Paul Bunyon Be Surprised!*

Back in December 1935 *Technocracy Magazine* published a cartoon by C. D. Batchelor. It was entitled 'The Real Revolutionist,' and depicted a scientist with a time bomb labeled 'Inventive Genius.' A recent example which illustrates everything that sketch signified is shown in the discovery by chemists of the U. S. Department of Agriculture's Forest Products Laboratory at Madison, Wisconsin, and by Dr. J. F. T. Berliner of the DuPont Company chemical staff, that wood can be 'transmuted' into a material as hard as many metals. One account said that the new 'alloy' is so tough that an oxy-acetylene torch requires nearly twice as long to cut through it as it takes to cut through a piece of steel of the same size.

The Forest Products Laboratory holds several public service patents on the process. The word 'uralloy' was coined by the Laboratory. The 'alloy' suggests that changes take place in the wood that compare with the effects of alloys in metal. The first syllable 'ur' derives from urea, the basic chemical used in the process.

Briefly, ordinary lumber is immersed in a bath of methylolurea, which combines with the cellulose in

the wood to form a new, ultra-hard 'alloy.' This impregnation takes less than an hour, while the usual creosote-preserving treatment requires several days. The raw materials for methylolurea compound are ammonia, carbon dioxide, and methanol (wood alcohol). These are so abundant that wood can be 'transmuted' at a cost of about four cents a board foot. Using the same method, sawdust, shavings, cotton, paper and crop wastes can also be hardened and molded. Both lumber and these other products can be dyed at the same time so that any color can be imparted to them permanently.

*I Didn't Do It With My Little Hatchet*

The basic research at Madison established that soaking wood in urea solution caused striking changes. When heated, the treated wood could be bent easily to relatively sharp curves. When it cooled, the wood became rigid again, retaining its new shape. But if reheated, it became plastic again. This plasticity suggested further experiments that showed that urea treated wood could be made to behave very much like some of the commercial plastics. Formaldehyde is one of the chemicals used to 'set' some commercial plastics and it acted similarly with wood. The investigators found that by add-

ing formaldehyde and certain other chemicals to the ureau solution, they could make the wood 'thermosetting,' that is, when the treated wood was heated, it would set permanently and reheating would not make it plastic again. This treatment also makes the wood stiffer, harder, and more water resistant.'

Because 'uralloy' is virtually flame-proof, it can be used in house and bridge construction. There, it can replace much steel and iron. This will also permit lighter construction parts since 'transmuted' wood is scarcely any heavier than the natural variety, while approaching the strength of steel, size for size. Its hardness, plus its plasticity, will permit its fabrication into superior furniture. Moisture does not affect it, so doors and windows, desk drawers, etc., of 'transmuted' wood will not stick in humid weather. Boat plank-ing made of 'transmuted' wood will be almost leakproof. This means less business for the pump manufacturers.

Among the net technological effects, when 'uralloy' reaches the mass

production stage, will be a considerable cut in the market for steel, fewer fires and many changes in the furniture, boatbuilding and construction industries. Farm and lumber mill by-products can be used this way, thus conserving much metal. Even some factory machinery can be made of 'uralloy' and perhaps even automobile frames.

Out west thousands of tourists visit the Petrified Forest each year. Trees which grew centuries ago are still atop the ground, perfectly preserved. The wood in them has strangely turned to stone, but still looks like wood. The slow processes of nature required milleniums of time to 'transmute' this wood into a stone-like alloy useful chiefly as paper weights and souvenirs. Chemistry does a better job of 'transmuting' wood into a hard, workable, long-lasting alloy and does it in one hour. Development of the 'uralloys' marks a long step forward in the conservation of America's non-replaceable natural resources.

Technology Marches On!

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### **Le Habitant Grows Such 'Quaint' Orchids**

'The Northwest Mounted Police have investigated 14,000 draft dodgers in the French province of Quebec this year and the police in khaki, who also arrest the AWOL's have been nabbing about 400 a month . . . notwithstanding the fact that the draft by itself does not conscript men for overseas duty.'—From *Chicago Tribune*, March 15, 1944.

'Quebec's youngest political party carries its ardent nationalism even to the banquet table. When Le Bloc Populaire wound up a recent Montreal convention five toasts were given in this order. The Pope; Canada; Quebec; Maxime Raymond, party founder and national leader, and Andre Laurendeau, newly appointed Quebec leader of the Bloc.'—From *Mac Lean's Magazine*, March 15, 1944.



# Technocracy and Your Trade

## The Steel Worker

by R. F. Novalis

*'One Ship Goes East and  
Another West, by the Selfsame  
Winds That Blow'*

**O**N the production and capacity side the American iron and steel industry set new high records last year. In 1944 the capacity will go still higher, although output will decline somewhat if the European half of the war ends this year. In so far as the man-hours needed per ton of steel and iron, that is something else. As one newspaper headline put it last September 8th:

### STEEL OUTPUT RISES DESPITE LABOR SHORTAGE.

This is nothing new, since Pearl Harbor, say; rather it is a trend which has been going on since World War I. Here are the official Census Bureau figures on this trend.

#### *Steel Mills and Blast Furnaces*

Year	No. of Plants	Employees	Installed hp. of Machinery	Steel and Pig Iron Output (Tons)
1899	688	222,500	1,600,000	22,000,000
1919	695	416,748	4,600,000	72,000,000
1939	475	390,000	4,944,000	88,300,000

Thus the number of iron and steel plants and the working force required to man them declined, while production mounted and the installed horsepower of engines and motors increased. The important point is not only the overall decline in employment but the rise in tonnage per

employee as a result of the use of more power and technology.

Back 45 years ago the average iron and steel plant workman was able to turn out about 100 tons a year, with the 7 horsepower of energy and the technology at his command. By 1939 he had nearly 13 horsepower plus a higher technology and so was able to produce about 230 tons a year. Of course, as the average strong workman can equal at best only 1/10th horsepower a day it was never the man who produced the steel but the power and technological processes. Those are overall basic trends. Within them are other factors.

Between 1924 and 1938 a total of 27 automatic strip steel mills were put into operation. These have a total capacity of 15,000,000 tons a

year; and have permanently displaced 38,470 steel workers, according to the *Monthly Labor Review* for May 1940.

The war has altered the steel picture somewhat but has not changed the basic trends. Indeed, it has intensified them. The wartime peak of

employment was reached back in June 1942 when 659,000 persons were on steel mill jobs. The 1942 average was 647,000. This dropped to 626,000 in 1943. Steel output, however, increased to 89,000,000 tons in 1943 from the 86,000,000 tons of 1942; in spite of the decrease in jobs.

Latest figures of the American Iron and Steel Institute give steel employment at 578,000 in March 1944. This is the lowest since November 1940 when it was 577,000. The 577,000 at work then turned out less than 6,500,000 tons a month while the 578,000 (only 1,000 more) at work in March 1944 turned out more than 7,500,000 in one month.

Who is turning out the extra million tons of steel a month? Not the lesser number of men, surely? Of course not. It's being done with kilowatts\* of electricity which, paying no attention whatever to the Little Steel Formula, works 24 hours a day without ever stopping, if necessary, for 1c an hour and less. Think that over for a while.

### *You Cut My Throat and I'll Cut Yours*

Besides the use of more extraneous energy in the steel industry which results in the displacement of workers, advancing steel and other metal-

\*According to the Federal Power Commission reports the iron and steel industry's consumption of electric power in 1939 was 12,750,000,000 kw. hrs., in 1942 it was 21,000,000,000, in 1943 it was 24,250,000,000 and in 1944 it will be around 25,250,000,000. This is double the 1939 rate.

lurgical technology has the same effect. For instance, consider the following two examples.

According to an item which appeared in the *Chicago Herald American* on December 14, 1943 the Kaiser Steel Company has developed a steel alloy which is 600 times tougher than nickel alloy and 150 times tougher than chromium alloy. The announcement was made by D. D. Barbour, assistant chief metallurgist of the company. Then, consider the following.

Life of high speed tools is upped 30% to 100% by 2 to 3 hours exposure to minus 120 deg. F. Coldtreated drills, at work on SAE steel Brinall hardness of 407, cut 256 holes before resharpening as against a former 48. Milling cutters, thoroughly chilled, withstand 24 hours continuous operation instead of 7. Hack saw blades, frozen for 3 hours at 120 deg. below, show 119% increase in service life. Taps for thread-cutting when refrigerated average 710 workpieces instead of 40.—*Modern Industry*, April 15, 1944.

But this isn't all that the steel worker has to contend with. Steel, as a metal, is in competition with other metals. Steel is a mixture of carbon and iron. All organic material contains carbon and it exists in a more or less pure state in charcoal, coke, coal and peat. But there is a limit to the amount of iron available. The Smithsonian Institution has calculated that the percentage of iron in



the earth's crust is 5.46; while aluminum, a steel competitor, is rated at 7.41:

Then, there is the growing family of aluminum alloys. This brings us to R301 and R303. These are new aluminum alloys developed by Reynolds Metals Company. R301 is a sheet metal and R303 is used for castings and extrusions. They have a tensile strength of about 64,000 pounds per square inch. The characteristics of these alloys are shrouded in military secrecy, for the present.

It is stated, however, that R301 is tougher and stops armor piercing bullets more effectively than steel. Both of them are credited with being easy to work and form. They are

likely to push steel out of the picture for many uses.

Well then, it may be said, all the steel worker has to do is to move over to the aluminum plant and carry on. Oh Yeah? It's not as simple as that. You see, technology and energy are also at work in the aluminum industry upping production and downing employment. Well, what then?

The answer is we will either have to control energy and technology—or else. The beautiful part about this problem is that these physical factors can only be controlled by non-Price System methods. If we can digest that the problem is half solved. Mr. Steel Worker, can you take a hint? Investigate Technocracy.

---

### *Plane Output Time Spectacularly Cut*

'Evidence of the remarkable efficiency of American workers came this week from the Aircraft War Production Council, composed of big Western plane manufacturers. It disclosed that the construction time of fighter planes has been reduced from 157,000 to 7,800 man-hours and the time on a four-engined bomber model was cut from 200,000 to 13,000 man-hours'.

*Labor, February 19, 1944*

Representative Harness (Rep. Ind.), conducted a poll of workers in 50 war plants for the House military committee. One of the questions was: 'Will you be obliged to sell your war bonds, and how soon, if jobless.' Ninety percent of the answers set the time at from one week to two years, the average being three months. From *Chicago Times*, May 15, 1944.

John Fennely, executive director of the Committee on Economic Development (a private organization) testifying before a Senate Military Affairs subcommittee recently said that mere reconversion back to the 1940 business level would result in unemployment to the tune of 15,000,000 to 19,000,000 persons as compared with the 8,500,000 jobless at that time. He attributed this probability to 'the expanded economy we have created.' Fennely added, 'Unless business production can be kept high that will be an intolerable burden.' From *Chicago Sun*, April 6, 1944.

Records of the Social Security Board reveal that unemployment has been increasing steadily throughout the nation since last November. Benefit payments under the Social Security law averaged more than \$6,000,000 a week during February, 1944. Records of the War Man-Power Commission, at the same time, reveal that an increasing number of persons have been applying at offices of the United States Employment Service. From *Cleveland Plain Dealer*, April 5, 1944.

# In the Question Box

by Public Speakers Division 8741-1

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Send in your questions on Technocracy and Total Conscription. They will be answered here. The following are a few received since our last issue.

---

What is the distinction between communism and Technocracy? E.G.

Communism is a political approach to problems of scarcity; in other words, a politician's attempt to divide up a scarcity equitably. Communism can function only where there is a natural scarcity.

*Technocracy* is an engineering approach to problems of abundance. In other words, a non-political but scientific design for distribution, not division. Since there is no natural scarcity in America, communism is inapplicable and unworkable here.

Is there any possibility of *Technocracy* turning into fascism after it is installed? T.S.

There's as much likelihood of that happening as there is of a 5,000 horsepower Diesel locomotive turning into a wheelbarrow. Technocracy is social progression in accord with science. Fascism is social action in reverse. Technocracy is a going forward; fascism is a going backward. They are mutually incompatible and not even remotely related. Fascism is impossible in a highly developed stage of technology because it is the distilled essence of human toil, hand tools and scarcity. For the same reason, *Technocracy* is impossible in a

handicraft-agrarian culture. Fascism cannot operate America's technological set-up by fascistic methods of compulsion in race, religion, economics and civil rule in general. An industrial civilization must be operated according to the physical laws of science. The more industrialized any culture becomes, the greater this compulsion is. Finally, we reach the point of development where only two alternatives are possible, science or chaos. America has almost reached that point now. Fascism leads backward and downward; science points the way forward and up. No, my friend, *Technocracy* can never turn into fascism.

Would not Total Conscription lead to the installation of a new social system? G.B.

Total Conscription is not social reform, nor revolution. Sovereign power will remain in the hands of the same statutory authorities who exercise it now. The social structure will not be altered. Technocracy is not proposing, either openly or covertly, that it be put in charge of running the country, either in Canada or the United States. Total Conscription is a blueprint for the designed direction of all national operations for the purpose of waging total war,



winning the peace and guiding America through an orderly transition back to peace in the postwar period.

Wouldn't Total Conscription be a form of dictatorship or totalitarianism? S.W.

Since Total Conscription will be under the authority and direction of our present democratic form of government, it could be neither more nor less dictatorial and authoritarian than that government is now. The United States Government is responsible to the people, and Total Conscription would be adopted for a definite period of time, i.e., the duration and six months thereafter. You'll have to look someplace else for a bogeyman; there's none in Total Conscription.

Will you please explain why our present administration doesn't seem to practice any of the principles of Technocracy when they know so much about it? F.M.

We don't know where you got your information that the Government knows so much about Technocracy, but we hope you are correct. As for the reason why they don't seem to practice any Technocratic principles, the answer is that these ideas are being put into practice much more than we realize. Technological principles are put into effect because of necessity and not because Technocracy advocates them. The difference is that Technocracy is always about five years ahead of the march of events. America will have less and less choice as to what must be done (socially speaking) as time goes on. The reason is that the social mechanism becomes steadily more complex. Don't be too impatient. We're on a one-way street with no outlets and we can't turn around and go back to yesterday. Events must proceed according to the direction and force of impact.

---

### **Glad To Meet You Doctor!**

#### *Chaplain Appeals for Unity at Home*

Dr. Daniel A. Poling, pastor of Baptist Temple, Philadelphia, Pa., and president of the International Christian Endeavor Society, has asked for unity on the home front—'the only front on which this war could be lost.'

'Unity is not uniformity, but there are no racial distinctions in foxholes, flying Fortresses and submarines. . .

'Whether they are right or wrong, men in the armed services are just about unanimous on two propositions, namely the principle of universal

service and in support of a practical method for taking the soldier vote. . .

*'The universal service principle that now applies to men in uniform, men in uniform believe should apply to every other American. The recognition of this principle on the home front and implementing it with law action is perhaps more important to morale on all fighting fronts than any other one thing. The possible effect of strikes and lockouts is secondary and incidental.'* (Italics ours.) Reported in the *Chicago Daily Times*, March 21, 1944.

# ***Straight From the Horse's Mouth***

**Read 'Em' And Wonder**

**by The Peripatetic Technocrat**

A corporation's efficiency is indicated by the number of men it can release from a job not by the number of men hired.

Sewell Avery, Chairman of the Board of Directors of Montgomery Ward & Co., March 2, 1944. (As reported in the *Chicago Sun*, April 29, 1944.)

The war will be over in two months. I can't tell my reasons. I have them, of course.

Henry Ford at Atlanta, Georgia, March 20, 1944. (As reported in the *Chicago Sun*, April 21, 1944.)

Within 60 days this country will be practically on a famine basis with respect to supply of beef. By the end of 90 days the pork supply will have shifted from a feast to a famine basis.

P. O. Wilson, Executive Secretary, National Livestock Producers Association, February 7, 1944. (As reported in the *Chicago Sun*, April 12, 1944.)

In reaching a conclusion we allow an adequate margin of profit, plus a margin of generosity, plus a margin for good measure.

Maurice H. Karker, Chairman of the War Department Price Adjustment Board, in an article on the renegotiation law in the *Railway Clerk*. (As reported by *The Nation*, March 4, 1944.)

Lesinski and I are on opposite sides in politics; he is a Demo-

crat and I am a Republican, but first of all we are Polish patriots.

United States Congressman Monkwicz of Connecticut, in referring to U. S. Congressman Lesinski of Michigan, at a meeting of the National Committee of Americans of Polish Descent, held recently at Detroit. (As reported in Marquis Child's column in the *Chicago Times*, April 21, 1944.)

We find everything all that anyone could hope for under present conditions. Some things could be done if there were nothing else to do and if we had someone to do it. So, as bad as it might be, we are pleased to find it as good as it is.

Report of a grand jury at Erie, Pennsylvania, regarding conditions at the country courthouse, after having undertaken an investigation at the request of a judge. (As reported in Sydney J. Harris' column in the *Chicago Daily News*, May 5, 1944.)

After the next war the United States will rule economically over a desolate and miserable planet, that is, until—the revolution. "When," I asked, "will the revolution come?" Not in my lifetime, but in yours, the great revolutionary said, and it will come in typical Yankee fashion—overnight. It will come because of unemployment and



because your system fails to distribute. It produces—yes—but after your war boom there will be a collapse and depression. 1929 will be but a child's play in comparison.

Leon Trotsky, in a conversation with Carleton Smith in 1940. (As reported in the latter's column in the *Chicago Daily News*, February 5, 1944.)

To this we can add that if America permits a violent revolution the only result will be a permanent depression, six feet under the ground for most Americans. Social violence is the Achilles heel of the Power Age.

**NATIONAL DEFENSE**—We believe that in time of war the nation should draft for its defense not only its citizens but also every resource which may contribute to success. The country demands that should the United States ever again be called upon to defend itself by arms the President be empowered to draft such material resources and such services and essential commodities, whether utilized in actual warfare or private activity.

The above was a plank in the Republican Party's platform of 1928. Heigh Ho! Heigh Ho! For the brave

politico! In time of peace he makes a platform for war. In time of war he makes a platform for peace. It is said that an eel is slippery; and that mercury is hard to pin down. Maybe so, but the champ of all champs in this respect is our everyday garden variety of politician. Heigh Ho! Heigh Ho! Off to the Conventions we go!

Capitalism and socialism have begun to find the way to peaceful co-existence and collaboration in the same world.

Earl Browder, ex-General Secretary of the ex-American Community Party, at a mass meeting in Madison Square Garden, New York, January 10, 1944. (As reported in the press.)

The U. S. House of Representatives is "the least enlightened and dumbest bunch I ever had anything to do with. I'm damn sick and tired of being in the majority and having the minority run the house."

Thomas Francis Ford, Congressman from California, in explaining his refusal to run for re-election although he is sure of winning his seat again for the seventh time. (As reported by *Time*, May 1, 1944.)

---

The National Association of Retail Druggists has come out flatfootedly against the Wagner-Murray-Dingel bill. The Association insists on the 'freedom of choice of practitioners' and is opposed to the 'autocratic regimentation of medical services.'

This pressure group has to its credit a successful effort to prevent the OPA from putting into effect a 15 percent cut in vitamin prices. Well why not? 'You scratch my back and I'll scratch yours.'

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Articles by the various Divisions of 8741-1 are collective compilations.

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'Universal Service, like unselfishness, works only when all work at it. If we draft workers, we must also draft profits.' Robert Quillen, in his daily column, *Chicago Sun*, March 26, 1944.

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According to a survey conducted by the New York City College sociology department more than 70 percent of New York City's population violates the OPA ration point rules, or buys on the black market. The survey said that families with incomes above \$3000 a year violate the law five times as often as poorer families. From *Chicago Times*, May 14, 1944.

---

A survey conducted by the *Chicago Sun* shows that black marketeers pocket at least \$75,000,000 a year in Chicago. The figure is considered conservative because it represents only 5 percent of the annual turnover of \$1,500,000,000 in hard-to-get items such as food, gasoline and liquor. From *Chicago Sun*, April 5, 1944.

---

"The great thing in this world is not so much where we stand as in what direction we are moving."—Oliver Wendell Holmes.

For copies of GREAT LAKES TECHNOCRAT and other literature, and for information regarding meetings and activities of Technocracy Inc., in the Great Lakes area the following Section addresses will be helpful.

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# TECHNOCRACY

## WHAT?

## WHERE?

## WHEN?

## WHO?

### WHAT?

★ Technocracy is the only American social movement with an American program which has become widespread in America. It has no affiliation with any other organization, group or association either in America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 25 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are \$6.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy—the Monad, an ancient generic symbol signifying balance.

### WHERE?

★ There are units and members of Technocracy in almost every State, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Victory Program with any interested people and Continental Headquarters will be pleased to inform anyone of the location of the nearest Technocracy unit.

### WHEN?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance—a research organization. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

### WHO?

★ Technocracy was built in America by Americans. It is composed of American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this country. Membership is open only to American citizens. Aliens, Asiatics and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife—as long as you are a patriotic American—you are welcome in Technocracy.

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# GREAT LAKES TECHNOCRAT

25c

SEPTEMBER-OCTOBER, 1944

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625 W. Pender Street

Vancouver, B. C., Canada



# Propaganda Incorporated

Voice of the Price System

by The Peripatetic Technocrat

---

**'Men's thoughts are much according to their inclinations, their discourse and speeches according to their learning and infused opinions.'**—Francis Bacon.

---

## *A Penny For Your Thoughts*

A penny isn't much in terms of Price System values but that is about all your thoughts are worth if you are one of the millions of Americans who rely on the customary sources of public information. By this we mean the self-called 'free press,' the radio, the popular magazines and non-fiction literature and that illegitimate offspring of the fourth estate, that saccharine voice of business, the 'house organ.'

In all history there has never been a people so deluged and deluded with misinformation as the inhabitants of North America at this particular stage of development of their social structure. Never before in history has any area attained the technological advancement characteristic of America today. The things developed during the last generation and the events occurring as a result of this are numerous, complex and intertwined. They are so advanced over, and different from, the developments of preceding generations and so fraught with national import that the

social picture as a whole seems to be highly confusing.

This is largely so because we approach the problem with the ancient concepts of social life and the verbal tools of yesterday's seven thousand years of human toil, hand tools and scarcity. There is a vast difference between the status of science today with its concepts solidly established in physical laws and the hoary ideas handed down to us from ancient cultures. This inequality of development has set up an irreconcilable conflict between the outworn agrarian-handicraft ideologies of our forefathers and the scientific concepts necessary for this generation to live and prosper in the Power Age. This conflict in our social structure is the lush field where Price System propaganda flourishes.

*'Little Jack Horner  
Sat In A Corner—'*

We Americans individually are the smartest people on earth but collectively we are the largest aggregation of suckers who ever quietly acquiesced to want in the midst of plenty. Here we are on the richest Continent on earth which offers an abundance of everything to its inhabitants and we haven't enough collective sense to assess the situation correctly. Even a mule has better sense. Nobody ever heard of a mule either starving or foundering himself

in the midst of plenty. We do both. When we can't get to the plenty, as is normally the case, we starve with Christian resignation. When we do get to the plenty, as in time of war, we founder ourselves with hoggish glee.

The only thing we never had any scarcity of on this Continent, and which is more abundant today than ever before, is propaganda. Most people think of propaganda as something fostered exclusively by enemies outside of America. We hear a great deal about German, Japanese, British and other forms of foreign propaganda. Such agitation does exist in our midst. It is the psychological arm of European and Asiatic fascism designed to conquer 'the richest loot in all history,' North America. It has been broadly publicized and today most well-informed citizens can recognize Hitler's line when they hear it. Even the native fascists, who peddle the foreign line, have been tabulated, sorted and labeled by the efficient efforts of the FBI. However, the native fascists who peddle the native line are not so easy to corner.

---

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**There are symbols in the 'minds' of men which stand for things and events in the external world. The total sum of all such symbols in all 'minds,' after eliminating duplicates, is the sum total of our knowledge of all things and events in our environment.**

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### *'Words Are — The Money of Fools'*

Terms derive their meaning not from the dictionary definitions of scholastics but from the way the great mass of people use them and the framework of reference within which they are used. As S. I. Hayakawa puts it, in *Language in Action*: 'Looking under a hood, we should ordinarily have found, 500 years ago, a monk; today we find a motorcar engine.' Propaganda means any systematic body of concepts or beliefs designed to influence a course of action. Note here, specifically, that a body of facts which *dictates* a course of action does not constitute propaganda. The intent to deceive, or influence, is not present.

The fact that the Price System press has more or less restricted its interpretation of propaganda to mean foreign agitation is excellent camouflage for the native propaganda of the American Price System.

The lag between our ancient ideas of social life handed down from the age of scarcity and the concepts of science and technology by means of which we live today has produced a situation wherein the old ideologies, no matter how suitable they may have been to the past, now function as a body of propaganda to resist social change and maintain the status quo.

This would not be important if it weren't for the fact that social change is being forced upon America, willy-nilly, by the impact of technology. This makes it extremely important for all of us to realize that we will have to relinquish the status quo and adapt



ourselves to a new status, whether we want to or not.

### *Our Hindsight Is Wonderful*

The retarding effect of this institutionalized propaganda upon social change is incalculable. There are whole libraries full of the stuff. It is incorporated into our educational system. It is a part of our moral beliefs. What is more important, these concepts, constituting propaganda against social change, are part and parcel of the system of trade and commerce. The institution of business just loves them. They are welded into its devious operations of buying and selling natural resources for private profit.

---

**The human being responds to its external environment through the mechanism of the conditioned reflex which is a purely automatic but tremendously complex nervous control mechanism. These conditioned reflexes are subject to manipulation through the device of controlling the environment.**

---

The retrogressive concepts of the Price System are legion. It would take a dozen volumes and more time than one man is allotted to adequately portray them all. We are born to the babble of their philosophy: 'Adam's sons are born in sin'; 'All babies are savages'; 'Man was made to mourn.'

We drag up our children to the same vacuous ideas that our parents used on us: 'A child should be seen and not heard'; 'Don't ask so many questions'; 'Mama knows best.' In fairy stories we put over the same line on our little citizens: 'Every cloud has a silver lining'; 'There's a pot of gold at the end of the rainbow'; and 'They lived happily ever after.' We enter school to the joyous ringing of the bells and listen wide-eyed: 'Figures don't lie but liars sometimes figure'; 'Reading maketh a full man'; 'There are two sides to every question'; 'Use your common sense.'

We get married with the symbolic ring of their slavery, pledging troth to that trilogy of incompatibilities, love, honor and obedience. We go to bed with them at night and arise to their hollow echo in the morning: 'Early to bed and early to rise makes a man healthy, wealthy and wise.' We work with them every day: 'His brow was wet with honest sweat'; 'A penny saved is a penny earned'; 'Go to the ant, thou sluggard.' When we get ready to leave this madhouse we die to their doleful dirge: 'Going Home, Going Home'; 'We will meet on that beautiful shore.' Finally, when Gabriel blows his horn and we all line up before the pearly gates, while the roll is called up yonder, some one is likely to shout: 'Blessed are the meek for they shall inherit the earth.'

*'Roll On, Thou Dark Blue Ocean'*

These are only a few lighter examples of retrogressive concepts in

Price System propaganda. This propaganda is not new. It was not invented by Corporate Enterprise to keep the people in subjection. It has been accumulating in folklore and tradition for thousands of years. It constituted the simple, homely wisdom of the simple handicraft-agrarian society that endured for ages. We inherited it along with the institutions out of which it sprang.

It is impossible to escape from this propaganda. It is omnipresent. It blares forth from the radio, the movies, the lecture platform and the school room. It stares at us constantly from the press and from magazines and books. It leers at us quietly, tier upon tier, in the subdued atmosphere of libraries. It is so much a part of our daily life that both those who receive it and those who dish it out are almost unconscious of the process. Nevertheless, it molds our reactions into Price System behavior patterns. It makes us conform to the Rules of the Game. If we know what is good for us, we dare not go counter to this propaganda. It is the psychological arm of the Price System which, along with its ecclesiastical, economic and political arms, is assigned to the job of maintaining the status quo.

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**The human being requires a smaller number of repetitions to establish a conditioned reflex than a dog, and he can sustain a higher number of orders of conditioned reflexes than a dog can. It is of this that a superior intellect largely consists.**

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While we cannot escape from this propaganda to any extent, we can study it, recognize its nature and define its technique of operation. Once this is accomplished we escape from its control over our thoughts. The same type of analysis which has been made of foreign propaganda can also be applied to the standard, everyday Price System propaganda. The splendid work done by The Institute for Propaganda Analysis, now defunct, on fascist propaganda will serve as a guide.

With the permission of the publishers *Harcourt Brace and Company Inc.* we herewith reprint the seven Tricks of the Trade of propaganda. They are taken from Chapter 3 of *The Fine Art of Propaganda*, edited by Alfred McClung Lee and Elizabeth Bryan Lee, copyright 1938.

### *Paste These In Your Hat*

*Name Calling*—giving an idea a bad label—is used to make us reject and condemn the idea without examining the evidence.

*Glittering Generality*—associating something with a 'virtue word'—is used to make us accept and approve the thing without examining the evidence.

*Transfer*—carries the authority, sanction and prestige of something respected and revered over to something else in order to make the latter acceptable, or it carries authority, sanction and disapproval to cause us to reject and disapprove something the propagandist would have us reject and disapprove.



*Testimonial* — consists in having some respected or hated person say that a given idea or program or product or person is good or bad.

*Plain Folks* — is the method by which a speaker attempts to convince his audience that he and his ideas are good because they are 'of the people' the 'plain folks.'

*Card Stacking*—involves the selection and use of facts or falsehoods, illustrations or distractions, and logical or illogical statements in order to give the best or the worst possible case for an idea, program, person or product.

*Band Wagon* —has as its theme 'Everybody—at least all of us—is doing it.' With it the propagandist attempts to convince us that all members of a group to which we belong are accepting his program and that we *must* therefore follow our crowd and 'jump on the band wagon.'

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**Practically all social control is effected through the mechanism of the conditioned reflex. All habit formation, all language, all 'thinking' is little else than the human being's response to miscellaneous stimuli, internal and external, in accordance with his existing conditioned reflexes.**

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### *The Proof Of The Pudding*

A knowledge of these seven methods in the use of the spoken and written word by which propaganda is

put over allows us to separate the device from the idea and examine the idea on its own merits. However, it is not enough to be aware of the devices of propaganda. One must also be able to analyze any statement in terms of physical operations.

This sounds difficult but it isn't. Any concept in the 'mind' must stand for something that exists (a thing or event) in the physical world around us. If any concept does not have this direct relationship with something real in our environment, then it obviously exists only inside our heads and cannot be measured or tested. Such concepts must be handled with the circumspection due their fragile status.

To illustrate this principle, let's take two questions. 'Are there parts of nature forever beyond our detection?' This question is devoid of physical meaning because there are no operations by means of which it can be tested or answered. Now for a different type of question. 'Does the shamrock grow only in Ireland?' Here is something with physical meaning for we can perform physical operations to determine the answer.

Even in books on semantics and propaganda one finds sweeping statements about 'truth,' 'justice,' 'democracy,' 'liberty,' etc. To say that these concepts have no meaning to us would be stretching a fact. The trouble is that they have too many different meanings. Their interpretation is a matter of individual preference. Even semanticists handle them carelessly.

We are making this distinction between the devices of propaganda and

the operational concept for the sake of clear understanding. The Seven Tricks of The Trade is the method by which the Price System puts over its propaganda. The operational concept of science is the yardstick by which the reality of any idea can be tested. The language of science is in terms which are rigorously definable in operational concepts. This can never be propaganda as we understand it. The fact that science can be and often is prostituted for Price System purposes is characteristic of Price System methods of operation.

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**Of no less importance in social control are the conditioned inhibitions. If they are taken young enough, human beings can be conditioned not to do almost anything under the sun. The things they are conditioned not to do are called 'wrong,' and vice versa. An individual's present behaviour is the sum total of his acquired reflexes.**

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### *Count Them One By One*

Let us consider the seven Tricks of the Trade seriatum. We'll present a statement of Price System propaganda to illustrate each device. Following it will be another statement on the same topic in the language of science. This parade of examples will serve three purposes. It will break down some of the regular Price System 'hoovey' with which we are deluged daily, into its component, silly elements. It will furnish a yardstick with which to measure similar guff.

Finally it will illustrate the language of science by means of which alone we are able to interchange a correct understanding of our American social problems in this Power Age in which we live. Here is the first example.

### *Name Calling Device*

The idea of abundance for all is a crackpot theory of crazy engineers.

Notice the 'name calling' words 'crackpot' and 'crazy.' The effect is to repel one at once from any serious consideration of the subject. Notice the misuse of the word 'theory.' By inference we get the idea that abundance for all is a theory only of crazy engineers. Therefore, the idea of abundance is crazy too. After all, haven't we always had the poor with us? The entire subject is dismissed by giving it a bad label, so that we will reject it without further investigation. Contrast the above statement with the following one.

There has been a verifiable analysis made of America's capacity to produce which shows beyond doubt that it is possible to distribute an abundance of goods and services to all citizens now.

This is a direct statement of fact. It must stand or fall on its assertion that the said analysis is verifiable. It is an operational concept because it is possible to relate it directly to things and events in our physical environment. It says exactly what it means and means exactly what it says. Science does not use the name calling device.



### *Glittering Generality Device*

America is more than a people; America is more than a nation; America is the apotheosis of all that is right.

This statement tells us nothing informative about America. It is a pure case of glittering generalities. There are no data incorporated to indicate the reasons for America's greatness. Instead it is exalted in one breath to the divine status of equality with 'all that is right.' The word 'right' is the glittering generality. No one knows exactly what 'right' is. It exists only inside our individual heads in highly disparate interpretations. There is no common agreement on what 'right' is, since it is not a real concept. Consequently, we cannot perform any physical operations to relate it to the things and events in our environment but only to what we 'think.' 'Right' is whatever we think it is at any given time and place. Contrast this with the following statement.

America is the number one technological potential of the world and no method of social governance now existing can bring about the highest functioning of its endemic setup of geologic conformation, equipment, technology and personnel.

Here is a whole bookful of information about America in one sentence. Any citizen possessing knowledge of our country's resources and technology can understand it. This statement is not propaganda for or against anything. It merely recites existing facts. Science does not use glittering generalities.

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**If we wish to understand the world about us it follows that we must use a language whose structure corresponds to physical structure. Man is entirely meaningless and inexplicable except in relation to his physical environment for he is conditioned by his relation to it.**

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### *Transfer Device*

Free Enterprise is the American Way.

Here is a good old standby of the Price System. It tells us exactly nothing about the characteristics of the thing called 'free enterprise,' i.e., where it came from, how it operates and what its net social accomplishments are, if any. Is 'free enterprise' the way of the two percent of Americans who chisel and live in abundance or is 'free enterprise' the way of the great majority who work when they can and live in enforced scarcity? Deponent sayeth not. Of course not! The deponent's purpose here is to transfer some of the prestige of something that is revered over to something questionable in order to make the latter acceptable.

Do you mean to say that 'free enterprise' is trying to make black seem white? The answer is 'yes.' Then what about the American Way, is there such a thing? Yes, there is a way of life that is applicable to all and can correctly be called the American Way. It is not what the chiseling minority of Americans would

like to have the great majority of citizens think it is. In the following paragraphs we will straighten out this pretzel of propaganda.

The American Way is the way of the world's greatest industrial civilization, the application of physical laws by quantitative and qualitative measurement to its social and industrial problems, the voluntary acceptance of scientific controls, and the production and distribution of abundance, security, equal opportunity and real democracy to all citizens from birth to death.

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**If we take an inventory of everything in our external environment we note objects, forces, things. This inventory will find no ideals, principles, essences. The most powerful microscope cannot find them, nor can they be revealed by mathematical equations. Physical science knows them not.**

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Here is an operational concept of what constitutes the real American Way. It is the partial application of these principles that has made America what it is today. These principles are intrinsic to the physical America in which we live. Their partial application was perforce compulsory in the past because that was the only line of development in our expansion as a nation. 'Free Enterprise' just went along for a free ride.

'Free Enterprise' never was either free nor enterprising beyond a certain point in its development. In

America that point was reached a generation ago. The so-called American Way of 'Free Enterprise' never did, does not now, and never can exist for any but a small minority. It's a physical impossibility. Of course, any one can open up a peanut stand, peddle shoestrings on the sidewalk or sell apples at the corner. Is that the American Way? Seventy-eight percent of the world's installed horsepower of machinery, 73 percent of the world's graduate engineers, over 1/2 of the world's known resources, the largest body of technicians and skilled personnel on earth, the most advanced technology known anywhere, 19 percent of the world's land area and 10 percent of its population thunder NO!

The American Way is not the picayune way of 'Free Enterprise' with its chiseling and corruption, its politics and profit, and its regimentation to the dictatorship of scarcity. This muddling, unproductive-non-distributive (except in wartime for an extra large profit), wasteful system of trade and commerce dubbed 'Free Enterprise' by its chief beneficiaries is not native to America. It is a part of the ancient Price System culture imported from the old world and put to work ravishing the natural wealth of this Continent.

The American Way is the way of science and technology which have made America great in spite of the century and a half long corruption of its politicians, the pillaging of its 'Empire Builders,' the picayune social brains of its 'Tycoons of Business' and all the 'cockroach capitalists' who



are forever bellyaching about 'free enterprise.'

The actual role of 'Free Enterprise' throughout American history has been that of one of a number of bloodsucking leeches which, now that some of them are being shaken off by the trend of events, are bawling for freedom for leeches to live off their host, so that their own position may remain secure for a little while longer. Science does not use the transfer device of propaganda.

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**Abstract concepts are first created in our 'minds' and then objectified by nonfunctional language. They have no operational significance since there is no referent for them in our external environment. It follows that such concepts cannot be measured.**

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### *Testimonial Device*

Eminent economists have made a study of scientific social ideas and declare them to be unsound.

Now, isn't that just too ducky. You can't get around that phrase 'eminent economists.' It is very respectable testimony. What does it matter if there are a dozen conflicting theories on economics and that the statement does not say which school studied these ideas? What does it matter that economics is not classified by any one above the fourth grade as being a science? What does it matter if economics is a controversial melange of opinions? The testi-

monial device consists in having some respected group or person say that a thing is good or bad. 'Many movie stars use Blurp's and Blurp's face cream, it makes them beautiful.'

You will notice that the statement says that 'eminent economists have made a study of scientific social ideas.' Now, it is highly unimportant whether the social aspect of science is considered sound or unsound in any one's opinion. The important point is whether or not its analysis and synthesis are correct. In order to determine this one must make the same scientific study of physical America that social scientists have made. If the facts uncovered and the measurements taken jibe with theirs or are at variance, then only can one determine anything worthwhile. You can't judge the quality of Blurp's and Blurp's cold cream by its Crossly rating nor the conclusions of 'eminent economists' by their skill in splitting hairs or juggling opinions. Following is a correct definition of economics. .

Economics is the study of the pathology of debt and how to keep goods and services scarce.

Here is a statement of fact devoid of propaganda, although it is necessary to comprehend the social aspect of science in order to understand it. Once grasped, however, it will be seen at once why 'eminent economists' have denounced the social aspect of science. The two are completely incompatible. One is dedicated to the study of debt whereby scarcity is maintained. The other is dedicated to instituting abundance by means of

technology. In spite of this oppositeness one will not find any propaganda against economics in any scientific social literature. Science does not use the testimonial device.

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**Only that which is real is measurable. Objects, forces, things are the only realities which can be discussed intelligently. They alone have meaning in reality. What useful meaning any abstract concept has can only be measured by the context in which it is used.**

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### *Plain Folks Device*

What is good for business is good for you.

Here is a bit of Price System propaganda that sounds plausible. It resembles the parable about the rich man and the beggar Lazarus who was thankful for the crumbs that fell from the rich man's table. No doubt Lazarus also thought that what was good for the rich man was good for him. That is the behavior pattern business is trying to inculcate with this propaganda. Following is an operational concept of business.

The institution of business operates to exploit the natural resources of this Continent and its people collectively for all the profit the traffic will bear.

Regardless of how much business pats itself on the back, that is a correct statement of how it functions. If business ever became crazy enough to consider the welfare of the Continent and the people it exploits, it

would have to go out of business immediately. It would be smart for business to cease using the 'Plain Folks' device of propaganda. Some day the people might take it seriously. That would be bad for business. Science does not use the 'Plain Folks' device.

### *Card Stacking Device*

Hitler uses the methods of science to control Germany's social order and that is what makes nazism so efficient.

Here is an example of stacking the cards against the presentation of any proposed solution of American social problems by the use of scientific methods.

If you recall, the card stacking device involves the selection and use of facts or falsehoods, illustrations or distractions, and logical or illogical statements in order to give the best or the worst possible case for an idea, program, person or product.

The statement is a mixture of facts, lies and false comparisons. It is a fact that fascism uses a mixture of science and pseudo-science to some extent in the operation of its social order. These methods are used for the dominance of a few over the great majority, and not for controlling the social order as a whole on a basis equitable to all the human components involved. Fascism uses pseudo-science when convenient, not for the solution of social problems but for their suppression.

By inference the above bit of 'card stacking' is also 'name calling.' It attempts to attach all the repulsive



connotations of fascism to any American social program based on the methods of science. Contrast this fascistic propaganda against the social aspect of science with a definition of fascism stated in operational concepts.

Fascism is a reversion to a lower order of civilization based on human toil and hand tools; it is a barbaric network of compulsions in race, religion and economics; it is the perversion of science and technology to the perpetuation of scarcity for the great majority with wealth and special privileges for the favored few; it is the consolidation of all minor rackets into one major monopoly for the preservation of the status quo.

Here is a verifiable analysis. Any one can collect the facts upon which it is based. As such it cannot be propaganda. The type of social retrogression characterized as fascism is contrary to the natural destiny of America. American technology is laying the foundation for a higher form of civilization, not a lower one. Science does not stack the cards; it sticks to the facts.

### *Band Wagon Device*

'Join the growing circle of smart housewives who lighten their labors with HI-DEE-HA-HA kitchen cleanser.'

'The Christmas spirit lies deep in the heart of man; do your Christmas hopping early.'

'Make your vote count on the win-

ning side; vote for Luke X. McGlue for Governor.'

'Get in on the ground floor; invest in Squedunk's Handy Widgits now.'

Here are only four of the host of bandwagon slogans we hear all the time. Their purpose is to get us to hurry up and do something because all the other smart saps are doing it. Jump on the bandwagon and let the suckers walk. Get rich quick. Be smart. Be on the winning side. Avoid the crowds. Get there first. Squeeze somebody else out. To hell with the other fellow. Me first. That's the psychology of the bandwagon device.

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**An abstract concept cannot be endowed with reality by using synonyms. This substitutes one abstraction for another. Thus we enter a maze of ever higher abstractions mistaking symbols for reality; and peopling our environment with a demonology of absolutes and spurious entities.**

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Following is a statement of urgency involving exactly the opposite psychology.

America must choose between Science and Chaos.

This sounds like a use of the 'bandwagon' device of propaganda. Nobody likes or wants chaos, so it appears they are being urged to jump on the 'bandwagon,' or else. The average man dislikes being forced to choose between two things and the semanticist dislikes two-valued orientations. We are not concerned with either of these dislikes here. The

point is what do we mean by 'science' and 'chaos' and is there any other choice available?

The term 'Science' in a social context means the application of scientific principles to social problems and social governance by science. The term 'Chaos' in such a context means civil disorder approaching the point of complete social breakdown. Social chaos can take many forms but in any form it will be hell on earth for the average man. There is no such thing as a nice, kind, orderly, Christian chaos. There's just plain chaos and it is just plain hell for everybody concerned.

'Capitalism' that latest stage of the Price System in America is dying on its feet. The entire North American Continental Price System has been rendered invalid by the impact of technology upon its structure. What vitality there is left in society in North America today comes from other sources than the traditional 'Capitalist' institutions.

From now on the American Price System can proceed in only two directions. It can collapse and be succeeded by a higher, more efficient form of social governance designed along scientific lines or it can revert to an earlier stage of its development when it was at a lower and slower order of operations. In the event this latter happens, the population or its living standards will also have to be reduced accordingly. Here is where chaos will enter the picture. In the event the Price System yields to science, there will have to be a diligent,

foresighted and forthright application of non-price system principles to social problems. It is, and will be, a race between social organization and social catastrophe.

One thing is certain; America cannot muddle along much longer. Our Continental growth curve has passed its peak under the Price System. If we are smart enough collectively, we can stabilize it at a high level for a long time to come. We have the men, machines, materiel and the 'know how' to do it. If we continue to be smart individually but stupid collectively, the lightning is sure to strike us down and write 'finis' to the dream that was America. Most of us will not even be here to read the last chapter of our history when it is written. Yes, indeed! America *must* choose between Science and Chaos. Science does not need to use the 'bandwagon' device of propaganda.

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**The structure of language should correspond with physical structure. The word is not the thing but only a symbol of the thing, or event, referred to. Keep that clear. Structurally spurious language is the breeding ground of propaganda.**

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### *How Long Is a Rubber Band?*

This just about concludes our excursion into the field of propaganda. Men are not motivated primarily by the use of words or the misuse of them, but by their physical interests. You can lecture all day to a starving



man about the sacredness of property rights and the stomach will still deny the head. Nevertheless, mental concepts are a powerful, secondary conditioning factor in the human makeup. When physical conditions are not too unbearable, men are, in the words of Sam Walter Foss 'Prone to go it blind along the calf paths of the mind, and work away from Sun to Sun to do what other men have done.' Such being the case, it is necessary to clear away as much mental rubbish as possible from our collective social consciousness. This makes the going easier all the way around.

In the beginning we defined propaganda as any systematic body of concepts or beliefs designed to influence a course of action. We also specified that a body of facts which dictates a course of action is not propaganda. Perhaps an example will serve to clarify the difference.

If you want to win an election, you erect a systematic body of concepts designed for that purpose. You take all the minority pressure groups into consideration and make up a set of promises to suit each one. Then you gauge the opposition's weaknesses and make another set of promises to convert them to your advantage. Then you circulate around among the electorate, waving the flag, kissing babies and engaging in sundry allied political activities. If your propaganda is carefully enough worked out and skillfully enough delivered, you may win. Compare this with a body of facts which dictates a course of action.

Suppose you want to build a bridge across San Francisco Bay? The factors here which influence your course of action are already determined. You do not build a body of concepts to suit the job; you find the facts which control the problem and then go accordingly. The height, breadth and weight of the bridge are not amenable to propaganda. They are determined by such factors as the stretch of steel, the varying temperature of the air, the type of bedrock underneath and the curvature of the earth. Your course of action is dictated by the facts involved. All you have to do is figure them out and get your decimal points in the right place. Such a body of concepts is not propaganda.

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**Men think and talk in symbols. To make a statement is to symbolize a thing or event. The point of all talk is to discover what the symbols stand for. Unless this is accomplished nothing comes through but empty sound waves.**

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*'When In The Course of Human Events—'*

It is not a far cry from solving the problems involved in building a bridge across San Francisco Bay to solving the social problems of the entire North American Continent. The modulus and calculus are the same. What is more, the problem is of the same order of complexity and

magnitude, relatively. That is to say, social problems are now technical problems, not political nor moral problems. It is only in these fields and similar ones that propaganda can flourish.

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**Communication is a two way process. The hearer's 'mind' works as hard as the speaker's. The scientific method in language is the only method which men can use to communicate with each other. Facts are for scientists the ultimate things from which there is no appeal.**

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Science, of course, can be used in any way. It is not a conscious entity but a body of knowledge and a method of approach. Under Price System methods of operation whoever sits in the seat of sovereignty in the social order controls society and all of its appurtenances, including science. In a scientific social system, no man or group of men would hold sovereignty over the social order. That would defeat the primary purpose of such a system. If it is to be scientific, it will have to be governed by a design based upon existing facts and changing from time to time as new facts become available. All men will be subject to the design. The directing control in a scientific social system could not go beyond the design. Their function will be limited to assuring adherence to the design only, and to its modification by the methods of science when necessary.

Sovereignty will reside in the social design itself.

Here is where the body of thought called TECHNOCRACY differs from every other systematic body of concepts in existence. It is not propaganda and it is not prophecy. It is the social aspect of science, comprising a body of facts which dictate a certain course of action. For this reason Technocracy's analysis and synthesis cannot be neatly classified and disposed of as propaganda. Neither can it be catalogued as the composite desires and opinions of a body of scientists and engineers imbued with humanitarian motives. It must be accepted for what it is.

After we have tested out our last futility, doodled with our last petty Price System project and been smoked out from behind our last excuse, there TECHNOCRACY will still be. In the long run, we will have to recognize that it is a social program dictated by a verifiable body of facts. There is no rebuttal possible either in economics, ecclesiasticism or politics, because the body of thought called Technocracy includes the best of all these and much more besides. There is absolutely no answer to TECHNOCRACY anywhere. And—this is not propaganda!

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'Something is wrong when a youth whose parents were penniless was put in jail for five months for stealing \$2.50, whereas a civilian who profited by illegal war contracts was merely fined and an Army officer was merely reduced in rank for the same offense.'—Russel W. Ballard, director of Hull House, Chicago, Ill., as reported in the *Chicago Daily News*, July 7, 1944.



# Three Is Not a Crowd

A Story About Roses

by Robert Bruce

*Scene:* Technocracy Hall on West Randolph Street, just at the edge of Chicago's loop and a block from the river.

*Time:* About 1:00 A.M. one night in early spring.

*Characters:* One Technocrat and two pedestrians.

Randolph Street is rather dark and deserted at this point and time. Traffic has thinned out to a trickle and only a few pedestrians hurry along toward the river to get a late suburban train at the Northwestern Station. The traffic lights at the corner have just been turned off for the night and only a few taxis and an occasional ancient street car rattle by. In between this sporadic noise, the street is very quiet. It's an off-night downtown.

Inside Technocracy Hall a lone member, somehow left over from the night's activities at the Hall, sits before a desk in the front office. The Hall, a ground floor arrangement of reception room, office and meeting space, is dark. The window lights are out and the *Flying Wing* and literature display is illuminated only dimly from nearby street lights. A single 60 watt bulb burns in the desk lamp where this member sits struggling with a composition. The single light splashes a cone of reflection on the ivory and gray walls in the dark hall.

The front office is partitioned off from the reception room near the entrance and the office door is closed. The member cannot see out onto the street but he can hear the taxis and streetcars rattle by. In the quiet periods in between he can distinguish the footsteps of pedestrians on the sidewalk outside.

As they near the Hall, the sound of leather soles striking the hard sidewalk increases in loudness. When a passerby is right in front, the click of his footsteps is at its loudest. As he passes on, the sound dies away and is lost. Once in a while a pedestrian stops and looks at the dimly illuminated window display. Others walk right on by without stopping.

As the hour grows later, the sound of passing footsteps becomes more infrequent. The distant noise of the Loop dies away to a subdued hum. Theaters have long since dumped their crowds out onto the street. Except for the News Reel Shows, the last movie house has flickered out its last scene. The faithful followers of Hollywood's interpretation of the American scene are wending their several ways toward the subway, the elevated and the railroad stations. In the quiet street the footsteps of the few pedestrians become louder and more distinct.

While this member is sitting there alone in the darkened Hall, trying to

express something of the vast body of thought known as *Technocracy*, a double pair of footsteps sound out as they approach along the sidewalk. The street is otherwise deserted at the moment and it is very quiet. The steps grow louder. He can tell from past listening that two men are hurrying along toward the railroad station and that they are almost up to the Hall.

Suddenly one high-pitched voice speaks out on the quiet street with these words: 'Look there, Joe, what it says: Section 1, Regional Division 8741, Technocracy Incorporated. I thought Technocracy died ten years ago.'

The one called Joe must have taken a quick look at the Section insignia painted on the two front windows, for his booming answer came back almost instantly: 'Hell, No! Technocracy never died! Didn't you know that?'

The two unknowns didn't even slow down. Their footsteps beat a loud tattoo on the hard sidewalk. There was a second of silence in this peripatetic conversation. The sound of their footsteps began to die away as they passed by. Then the first one replied: 'No, I didn't know.

'In no era of economic history has there been a successful campaign against the strong trend of change during the world crisis, and the writer feels that the coming world crisis will be no exception to the historic rule. The time is short for the thinking business and economic leaders, and the reporters of their thinking, to begin a plan to change and strengthen their basic institutions so that we can have a

Well, what do you know about that!'

The sounds of both voices and footsteps then died away toward the river and a peculiar stillness hung over the street for another moment. An approaching rattletrap street car broke the spell.

The lone member sitting at the desk straightened up. He realized suddenly that he wasn't alone. Out there on the street, hurrying to get home, were two unknown American citizens talking about Technocracy. Two men suddenly confronted by a window sign with the word 'Technocracy' had started talking and both of them knew something about it.

If it weren't for the fact that you just don't chase people on dark streets at one o'clock in the morning in Chicago, if you know what's good for you, he would have hurried after them with some TC leaflets.

As it was, he turned back to his composition and strangely enough the words and idea sequences began to flow forth more easily than before. He reflected to himself: 'I'll bet there's a lot more people than we imagine who know something about Technocracy.'

Remember the story about the roses?

system of abundance that is so glibly talked about in the news, but so little understood.

'You cannot have a system of abundance based on a financial and credit foundation that was designed to carry a structure of economic scarcity.'—Excerpt from a letter written to M. S. Rukeyser by the President of an industrial company in Milwaukee, as published in the *Los Angeles Examiner*, June 23, 1944.



# *The Moron's Delight*

## Two Paradoxes of Technology

by R. W. Herring

### *Only One Way To Add Two and Two*

The first paradox of modern technology is that while it requires a great deal of accumulated knowledge to create a highly complex machine, almost any moron can operate it. Any child can operate a radio. It took engineering brains to create it. Our social system in America today is the most complex physical mechanism that ever existed anywhere at any time. Yet we are operating it with methods that would delight the heart of any dyed-in-the wool moron. We operate it as though all the parts were separate and complete units, instead of being integral parts of the whole which must be operated in proper relationship to the other parts. Is it any wonder that our social system is well on the way to breaking down?

Business and politics are the morons at the controls of the individual parts of our technological social system. Every private enterprise moronically insists upon operating its part when it pleases, as it pleases, without regard to the resulting effects upon the other parts or the mechanism as a whole. The public senses this and exhibits unrest and concern. Unable to discern the trouble, it takes refuge in escapisms; some go to the beer garden, while others go to

church, so to speak. Both are seeking escape from what they fear and cannot understand.

Our social dilemma is not as difficult as it seems, however, once the problem is correctly stated. Here is a brief outline of the American social problem.

First, we must understand that our social problem is a physical problem, a technical problem. This postulate is inherent in the technology of American civilization. It is an axiom in the working out of physical problems that the choice of methods of solution is in inverse ratio to the scale of magnitude and complexity of the problem. The tougher the job, the fewer ways there are to do it. When any physical problem reaches a certain point in magnitude and complexity, only one method of solution is possible, and there is no choice whatever left to us. This is the point we have now arrived at in our social operations in America. Our problem can be solved by one method and no other. Paradoxically, then, our problem, instead of becoming continually more complex, becomes steadily easier to understand and solve, once the factors are all stated.

### *Taboos Of The Power Age*

There are certain things that can't be done. You cannot take all the

parts of a highly complicated machine, toss them on the floor for a bunch of kids (or morons) to play with and expect them to assemble a complete, smooth running machine that will perform the function for which it was designed. Neither can you take a technological social system and hand the various parts to politicians and business men and expect to get a smooth running machine that will turn out the physical requirements of the people of America. The American social mechanism consists of the individual technological parts: the farms, mines, factories, communications, transportation, educational, recreational and entertainment facilities, plus that 'Orphan Annie' of business and politics, distribution. This is obviously a problem of engineering design, of integration and coordination. Engineers, using the methods of science, have designed and built all the various parts of our social system. They and they alone are capable of assembling them into a social mechanism that works properly.

It cannot be done by lawyers dealing with those imponderables called 'right' and 'wrong,' for these have nothing to do with the physical world. 'Right' and 'wrong' are abstracts and represent nothing real in the physical world. Consequently, there is no operation that can be performed with them which will result in a close agreement among men as to their exact characteristics. Being non-existent in reality, they are not subject to physical laws. Thus there will always be as many different in-

terpretations of 'right' and 'wrong' as there are individuals possessing such concepts. Agreement being impossible, it is therefore necessary to abandon 'right' and 'wrong' as being of any use in solving social problems. This does not mean the abandonment of law and order and the institution of anarchy in their place. It does mean that the affairs and relationships of men and social operations must be brought into agreement with the dictums of the physical world of reality. Technological equipment knows nothing of 'right' and 'wrong.' Your car operates just as well going the 'wrong' way on a one-way street as it does going the 'right' way.

### *Politics Is The Art of Balancing Opinions*

Neither can an efficient social mechanism be assembled by politicians for they deal in beliefs, prejudices, opinions and traditions. Your radio cares nothing for these things. You may be of the opinion that a light bulb can be substituted for a burned out power tube in your set. But, your opinion notwithstanding, it will not work. You may believe that you can operate your radio by plugging it into any light socket anywhere. If it is an A.C. set and you plug it into a D.C. line, you will soon discover, in terms of fireworks, just what effect your beliefs have upon its behavior. Perhaps you dislike having children fiddling around the radio, fishing for horse operas or the women of the house listening to sob-



dramas. The radio knows nothing of your 'high' taste or of the 'low' taste of others. It 'gives out' with whatever is put into it and responds only to the proper manipulation of its controls, regardless of the age, sex or 'brains' of the operator. The same holds true of every other piece of technological equipment, small or large.

Neither will the philosophers ever solve America's social problem, for they deal in morals and attitudes. Technological equipment doesn't give a hoot about either of these. There's nothing moral or immoral about a machine. It's purely a question of function. A locomotive will run over an innocent ten-year old girl, if she gets caught out on a long viaduct, just as readily as it will crush any hardened old sinner. Nobody, ever yet, violated a physical law. You can entertain morals and attitudes about man-made laws, you can circumvent and violate them, but physical laws just keep on operating, willy-nilly.

Economists, bankers and business men are likewise useless in any projected solution of social problems. Economists study the pathology of debt and how to keep goods and services scarce. Bankers buy and sell debt. Business men exchange goods and services for a profit. If you have a car, it will function to the consternation of all these, whether there's a million like it on the road or not, whether there's a mortgage tacked on it or not, whether it was sold at a profit or a loss. Your car is not concerned about these things; it

merely obeys the function of its design.

### *Engineering Is Measurement*

Only engineering methods can create all the intricate parts that go to make up an automobile and put them together in such relationships that you can hop in, step on the starter, shift the gears, press down the accelerator and speed thoughtlessly on your way. Likewise only engineering methods can draw a design for the vastly more complicated mechanism that is our social system today. In this fact lies the only probability that it will ever operate to produce and distribute all the physical requirements of the American people.

Engineering is neither moral nor immoral. It has nothing to do with opinions, beliefs, prejudices, traditions, attitudes, philosophies, etc., none of which exist in the physical world of reality. Their only place of domain is in the 'mind' and we would do well to segregate them there. We live in a physical world. The production and distribution of the goods and services necessary for our existence and enjoyment of life cannot be done by speculating on the imponderables. It is a physical problem. The engineer must of necessity deal with the facts of the world we really live in. He is trained to deal with physical things and their relation to one another. Thus, he is best qualified for the big job that must be done in America.

A few years ago the lawmakers of a certain state passed a law requir-

ing that the culvert pipes used in the construction of highways must have a circumference of exactly three times the diameter. The reason given was that  $2 \pi R$  was too hard to figure. Now,  $C=2 \pi R$  is a physical relationship *discovered* by scientists and used by engineers. Both are powerless, along with the lawmakers, to alter it. Physical phenomena are not subject to alteration by agreements among men. Consequently, to this day, all culvert pipes in that State have a circumference equal to  $2 \pi R$  despite the fact that it is against the law.

All attempts to apply non-physical concepts to physical things are certain to end in failure. Physical phe-

nomena majestically ignore any and all attempts to inject non-physical concepts such as 'right,' 'wrong,' 'opinions,' etc., into their operations.

The American people today face both opportunity and disaster, abundance or annihilation. Shall we apply social engineering to our way of life in America or go down to oblivion? Technocracy Inc. is the only social engineering organization in America today. It offers the blueprints and specifications for the designed operations now called for by the march of events, both in the war and in the more perilous peace that will follow.

Technocracy can afford to wait. Can you?

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### **You Said It Brother!**

'It is time for America to recognize that the job of postwar planning is being botched. We are botching the job. Congress is botching it. The common denominator of (all) planners is their conservatism. In general, they are men whose bias runs against the kind of bold and unprecedented action that we need. We need not only planning for business, but planning for the people. The postwar job is twofold: first, to bridge the gap in the flow of purchasing power during the transition period; second, to maintain that flow at full flood thereafter. Timid and piecemeal efforts cannot succeed. We cannot put 15,000,000 men to work solely by giving business the green light. The industrial machine must have gas in the tank and oil in the crankcase. It is government's responsibility to see that it runs on all cylinders in peace time as in war.' Excerpt from *Chicago Sun* editorial of May 6, 1944.

'Scientific achievements, accelerated by the war, will bring about revolutionary changes with a suddenness that will be almost unbelievable when the war is over,' according to Walter J. Murphy, editor of *Industrial and Engineering Chemistry*.

'After the war we will be in command of a productive capacity many times greater than that which we possessed a few years ago. We must never return to the philosophy of scarcity as the remedial agency for our economic ills,' Murphy said.

'Scientists . . . are releasing new products, new materials, new processes, that can and must bring a new order of life to all. Without this ability to supply the temporal needs of mankind the Four Freedoms of the Atlantic Charter will be only a futile gesture. Only when these needs are satisfied will the predatory instincts in man be stilled.' *Chicago Tribune*, March 24, 1944.



# Technology Will Get You

(If You Don't Watch Out)

## *Nibbling Around*

In order to save manpower and equipment, the Puget Sound salmon canning industry today was placed under a concentration order by Coordinator of Fisheries, Harold L. Ickes, and as a result fewer packing plants will operate this year than in any year since 1893.

Only three plants will operate this year instead of the usual eleven, although one standby plant will be available if the runs warrant its operation. A single plant, the largest in the area, will pack salmon for nine different firms. This plant, at Anacortes, Washington, has a capacity of 10,000 cases a day and storage facilities for 100,000 cases. The other operating plants will be at Deer Harbor and La Conner, Washington.

A saving of more than 525 cannery workers and tender operators will be effected by the consolidation plan, and 27 cannery tenders will be released for use in other activities. There will also be considerable savings in the use of diesel oil and the maintenance of salmon cannery equipment.—Excerpt from release of the Department of the Interior, Information Service, U. S. Government, April 12, 1944.

## *They Said It Couldn't Be Done*

'Out of the Department of the Interior today comes a saga of the American home front, dealing, among other things with a guy named Sam—G. I. Joe's uncle in mufti.

'It concerns 125,000,000 pounds of aluminum that last year wouldn't have gone into planes to spearhead the invasion of fortress Europe if Sam hadn't doped out a way of stepping up power production at Grand Coulee when people said it couldn't

be done.' Sam is Samuel Judd, 52 year old senior engineer of the Bureau of Reclamation. Sam won an award of excellence and a raise of \$200 a year.

'Shortly after Pearl Harbor the Grand Coulee power plant, mightiest war weapon of the nation, needed two good turbines and needed them sorely. If the west powerhouse, then nearly completed, could be supplied with two big turbines right then, it could cut two years off the time required to make and install the ones that had been ordered. That would mean increasing aluminum production by 125,000,000 pounds a year. It would make a lot of planes just when we needed them most. But where to get the turbines?

'Somebody suggested that there were two good ones at the Shasta Power plant, down in California. They could be spared. But they were built for counterclockwise operation, and the penstocks (inlet pipes) at Grand Coulee had been constructed for clockwise turbines. The Shasta turbines couldn't be inverted.

'That was a poser.

'The construction engineers were stumped.' So was Sam—at first. But he got to thinking. He scratched his head and looked the situation over. Then he came up with an idea. "You can't make water run up hill," he reasoned sagely "but you can change its course to one side." Why not bore into the concrete construction from another angle, change the course of the penstocks and make the water hit the turbines from the right side? It was a daring engineering idea and might upset a major part of that giant structure. But Sam put it over. And as a consequence Grand Coulee has produced over two billion kilowatt-hours of electricity more than otherwise would have been possible.' From *Department of the Interior Release*, May 21, 1944.

# The Handwriting Is Getting Bigger

From United States Department of Agriculture Release  
Plain Facts About the Forests

Ten of the most frequently misunderstood facts of the forest situation in the United States have been listed by the Forest Service, U. S. Department of Agriculture. These misconceptions, with the truth in each case, are:

One-third of the United States is forest land so there always will be plenty of timber.

*Fact is*, of 630,000,000 forest land acres in the U. S., 168,000,000 are not suited or available for growing timber. 77,000,000 are virtually non-productive as a result of destructive cutting and fire, and all but 100,000,000 of the rest has been cut over and produces only a fraction of what it might.

Almost as much usable timber still stands as was cut since the birth of the Nation.

*Fact is*, records show that the total volume of standing timber in the U. S., was reduced almost 40 percent from 1909 to 1938, to say nothing of recent intensive logging necessary because of the war.

Eleven billion cubic feet of new growth occurs each year—so we shall always have an abundance.

*Fact is*, nearly 17 billion cubic feet, of 50 percent more than total growth, was cut or destroyed in 1943, while in sawtimber alone

drain was almost twice annual growth.

If fire were kept out, forest growth would equal forest drain.

*Fact is*, even if the 2 billion cubic feet lost each year to fire, insects and disease were all saved, drain would still exceed growth by a substantial margin.

Only about 2 percent of the sawtimber stand is cut annually so the supply of some 1,764 billion board feet should last 50 years—even if there were no new growth.

*Fact is*, the cut for lumber is only 60 percent of total yearly sawtimber drain, while only about two-thirds of the supply, or thereabouts, is accessible to loggers at reasonable cost.

There are no timber shortages, only shortages of labor and equipment to get out the timber.

*Fact is*, there are no longer adequate sawtimber supplies accessible throughout the country. Dependence for high-quality timber is largely on remaining virgin forests of the Pacific coast. There are actual shortages of such high-quality, specialty timbers as yellow birch, yellow poplar, Port Orford cedar, air-plane spruce, and shipbuilding oak.

Millions of trees are being planted. *True*—but up to 1940, all agencies,



public and private, established only 3½ million acres of successful plantations, while the National Resources Planning Board sees a 25-year, 32-million-acre planting program as necessary to meet the nation's "most urgent" tree-planting needs.

"Tree farms," or private timberlands managed on a continuous-crop basis, represented as becoming general practice.

*Fact is*, splendid as the "Tree Farm" movement is, spokesmen for private industry claim only 7,700,000 commercial forest acres—out of 341,000,000 privately owned—as having been "designated" as "Tree Farms." So long as the rules set up for "Tree Farms" are followed, productivity will be maintained, but

of this there is no positive assurance for the future.

Public control of cutting practices on private lands—would that not conflict with freedom of enterprise?

*Fact is*, proposed public regulation would require owners only to cut timber according to rules established through thoroughly democratic processes, but would not touch the question of when to cut or how fast. They would stop forest destruction and deterioration and keep the land reasonably productive.

Our private forest lands are being well handled.

*Fact is*, the latest authoritative government estimate shows that 80 percent of all cutting on private land is still done without conscious regard to future crops.

### ***This Explains A Lot***

'U. S. ARMY IS STUCK with a lot of fourth-rate officers here at home. And not much can be done about it unless the top-men decide on drastic action. Back in 1941-42, thousands of not-so-good industrial executives, wardheels and play-boys managed to wangle commissions through politicians. They have advanced, automatically, to be Captains, Majors, Lieutenant-Commanders and the like and fill plush, but important jobs, in Washington and at the major bases. Specialists from industry and professions who have been drafted in recent months will have to serve as privates and noncoms for the duration because the political appointees are "in" and officer quotas are filled. That item accounts for a lot of bungling at both War and Navy Departments.'—From *Pathfinder*, April 17, 1944.

'We who were stopped on the Rhine by . . . an Armistice (a negotiated peace) in 1918, know that the Armistice was the first step away from lasting peace. It was dictated by civilian and not military command. The question of victory is not a political issue, it must be answered by military command.' James R. Durfee, Antiga, Wisc., American Legion, July 2, 1944.

More than 90 percent of the Army's paper requirements during the past year were met by 'coarse' grades made largely of waste paper.

'Free enterprise spent \$2,130,000,000 on advertising in 1943. What about the paper shortage? Don't be silly, let the next generation worry about it.

# From the Camera's Eyevew

## The Achilles' Heel of Technology

### *The Weakest Line Is The Strongest*

Achilles was an ancient Greek hero whose exploits in war were written up by Homer, about 900 B.C. He was reputed to be physically invulnerable except in one place. According to the story, his mother had dipped him, while an infant, into the River Styx. This immersion rendered him invulnerable except in the heel by which she had held him. After many adventures, Achilles was killed, at last, by a wound in the right heel.

This story is a part of elegant literature, a myth. But it has a point worth considering. There is a similarity of a sort between the invulnerability and weakness of Achilles and the invulnerability and weakness of modern technology in America. In most respects, technology seems 'invulnerable' but it is utterly dependent upon a slender thread of precise adjustment and control. Technology is tenuous.

Electric power comes in over a thin wire. Shut off that flow and you convert the finest industrial plant in the country into a pile of junk, fit only as a nesting place for birds and rats. Stop the flow of power to our big cities and they become smoldering morgues for millions of people in a few days. Drop a few dozen blockbuster bombs in the railroad yards at Chicago, Kansas City and a few other points and you disrupt a Continental transportation system. Manufacture, transportation, communication and agriculture are basic in America's technological structure. Unless they function smoothly, social welfare and public health decline toward zero and education is a useless pretense. First things always come first.

The greater technology becomes under the Price System, the easier it is to destroy. This paradox is a result of the clumsy interweaving of some physical laws with the Price System of trade and commerce and the exclusion of many more important ones because their adoption would invalidate the entire status quo.

### *What Color Is A Chameleon?*

Industrially, technology is the application of physical laws to the production and distribution of goods and services. Socially, it is the adaptation of the social structure to the verities of the physical world in which we live, and obedience thereto. The Price System is the devious, opportunistic methods of the institutions of business, finance and politics, while its social structure is the reflection of a hodge-podge industrial system that grew up out of mercenary instincts developed to a pathological degree by long ages of scarcity. Technology and the Price System are incompatible in the nature of things. Here is the focal point of social instability in the Price System and the source of technology's weakness today.

The average American is interested mainly in how much he can chisel out of society and how little he can get away with giving back in return. There is scarcely any social morale in this land, except in the Armed Forces, which is not interpreted in terms of personal gain. Our mixed-up culture of technology and chiseling Price System methods has reached a point of development wherein its operation and safety is dependent upon an ever-increasing number of physical factors. As social instability grows and social morale sinks lower, technology becomes ever more tenuous.

The Achilles' heel of technology is social violence. It must be strictly tabooed. Should internal strife occur, it will result in a major social catastrophe. There must be no reduction of America's great technology. Any party or group advocating social violence as a solution of America's problems is guilty of Continental treason. Amidst all the organized confusion in America today there is only one program that will make social violence unprofitable for any party or group; that will provide individual security through collective security; that will heighten social morale through a common objective; that will thus free technology from its tenuousness and guarantee the greater future of America. That program is **TECHNOCRACY'S VICTORY PROGRAM OF TOTAL CONSCRIPTION OF MEN, MACHINES, MATERIEL AND MONEY, WITH NATIONAL SERVICE FROM ALL AND PROFITS TO NONE.**



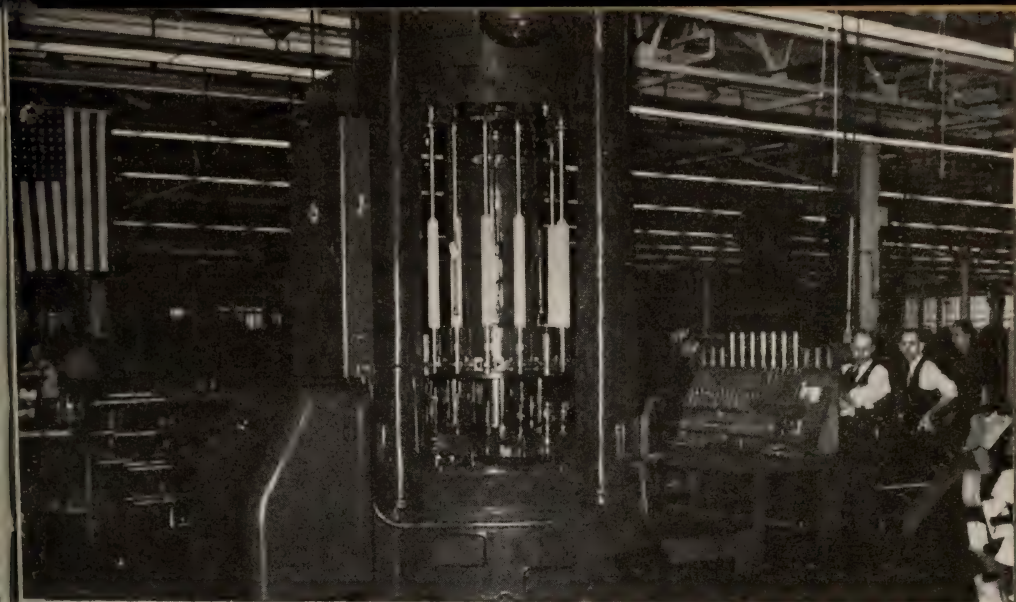


Photo: Courtesy General Motors Corporation

This 14 spindle vertical machine designed for chambering barrels on 20 mm anti-aircraft guns replaces 10 screw machines formerly used. It reduces machining time from one and one-quarter hours to four minutes. A great deal of training, knowledge of physical laws and industrial processes has gone into the design of this assembly. It displaces the skill of 10 operators and produces 19 times as much finished work. It is a complex, efficient machine, yet it is easy to operate. This is our first paradox.



Photo: Courtesy Monsanto Chemical Company

you got the idea in the first picture you will be able to see how it is carried further here. This is the control room in the dehydrogenation unit at the Texas City, Texas styrene plant. Styrene is one of the raw materials essential to making Buna-S synthetic rubber. On this panel remote from the actual operations, the most minute variations in the flow line are recorded and adjustments made. Complex skills are reduced to a matter of automatic recording and simple adjustment, by precise control.



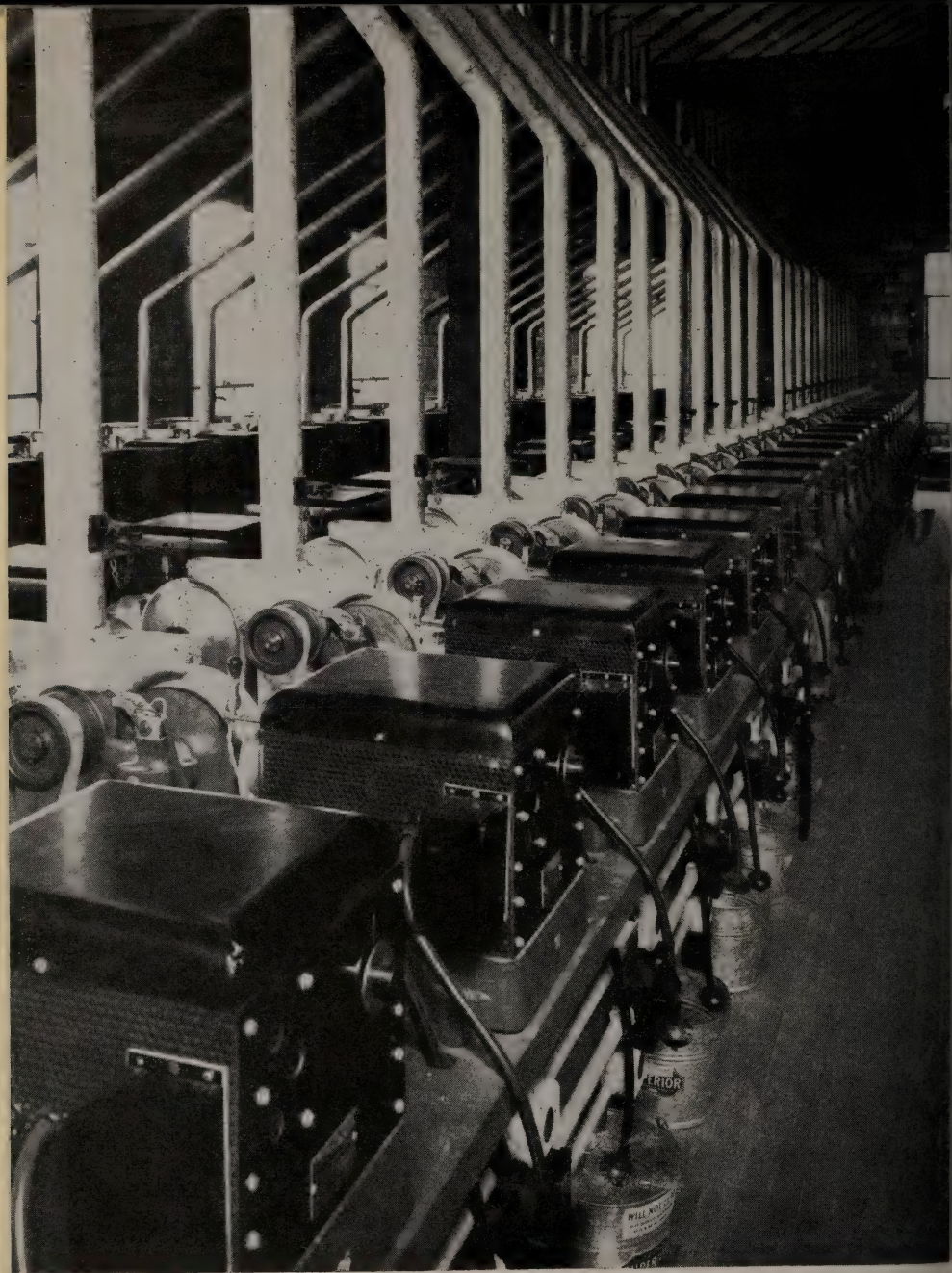


Photo: Courtesy General Electric Company

Here the technological process of reducing labor and skill to simple operations is carried to its ultimate development. This is a battery of photoelectric-thyratron bean sorting machines in action. No human attention is required except for maintenance. The process is fully automatic. The beans pass before electric eyes. The white beans get by but the discolored ones are flicked into a reject chute by metal fingers. A fine watch is a very intricate mechanism but even a moron can wind it up.





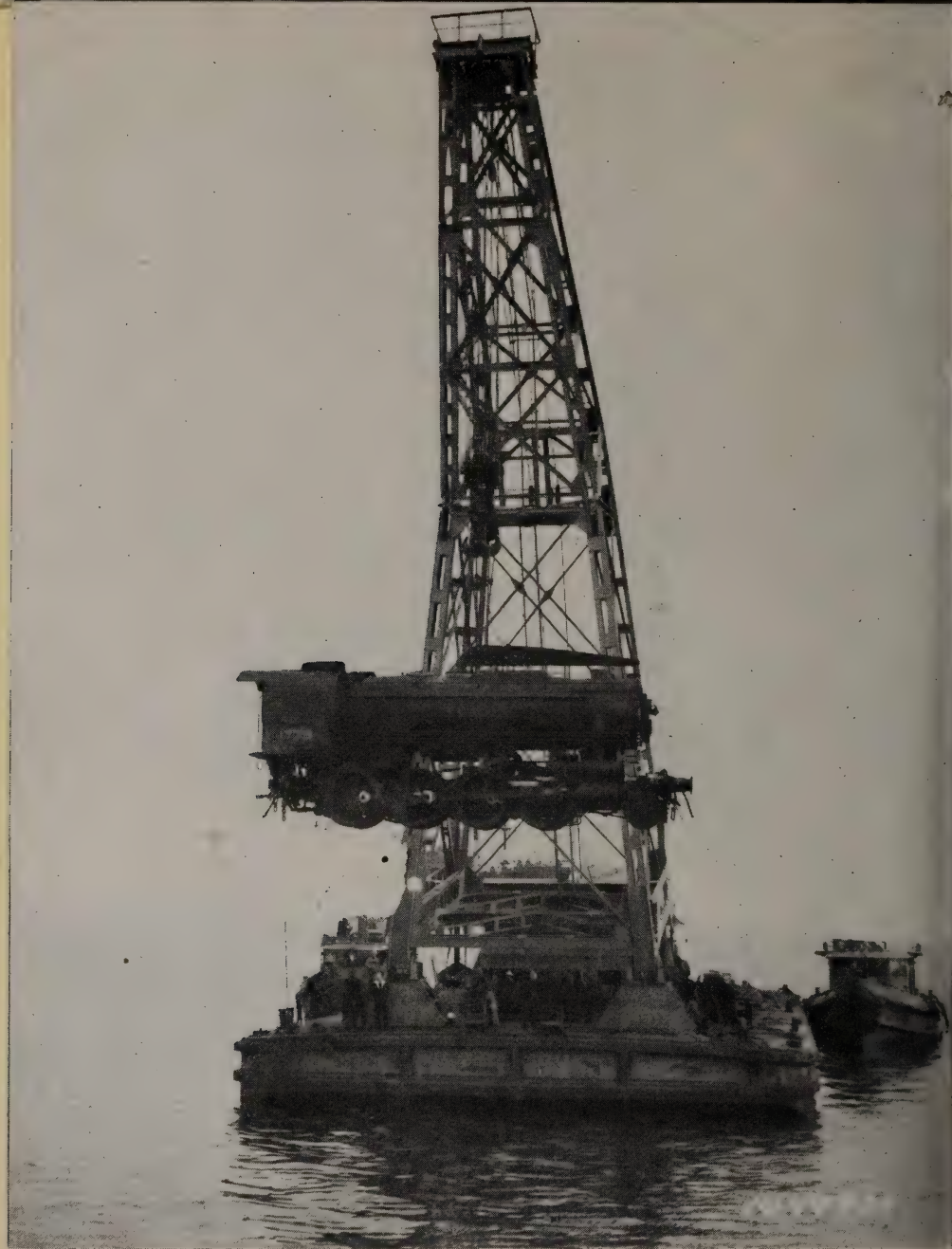
Official U. S. Navy Photograph

An interior view of the radio and pilot compartment in a PBM Mariner, Navy patrol bomber. Note the maze of dials and instruments. Most of the technology and skill represented here was almost totally unknown 40 years ago. It is a product of the Power Age and requires training, knowledge and precise control. The whole setup is highly developed, complex and tenuous. Yes, tenuous is the word, for its stability depends upon exact adjustment of coordinated factors. Any moron can ruin a fine watch.



Official Photo U. S. Air Forces

See what we mean? Intricate highly developed technology is easy to destroy. Here, Nazi flak has reached a Martin B-26 Marauder of the U. S. Army's 8th Air Force. The formation is somewhere over France. Flame billowed out from a direct hit and nearly enveloped one of the other planes. The bomber was destroyed and crashed while burning. All that fine machinery, technology, skill and personnel ruined in an instant. Mechanisms of the Power Age need constant and precise control.

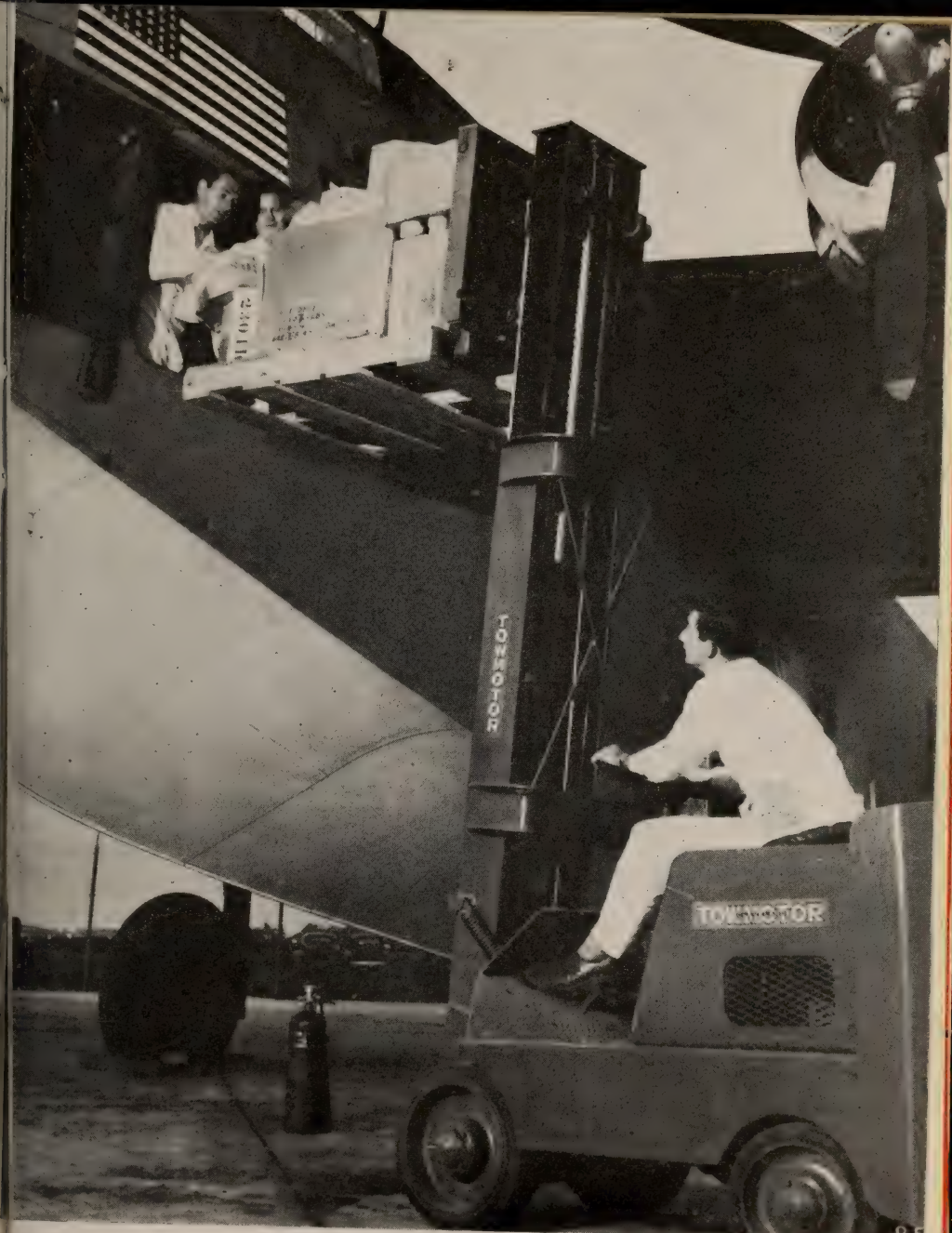


Signal Corps Photo

Notice the background painted out of this picture for military reasons. The most important part remains. Here is a 72 ton locomotive being unloaded by a floating crane, at Casablanca, French Morocco. It would be easier to destroy the locomotive than the crane. It is a far more complex mechanism. So also is our social system today far more complex than that of 40 years ago. Get the idea? Our social system, too, requires precise control for stability. The Price System promotes instability.

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Here is a rugged little giant. It is engineered to the last decimal point. Sixty to sixty-five percent of all production time is consumed in handling operations and only 35 to 40 percent in actual production. This Towmotor has a capacity of 4000 lbs., can elevate its load about 12 feet at a speed of 40 feet per minute, and travels 8 miles per hour. There is a greater future for this mechanism in a technological control. There will be a heck of a lot more products handling then.

Photo: Courtesy Towmotor Corporation





Official Photo U. S. Air Forces

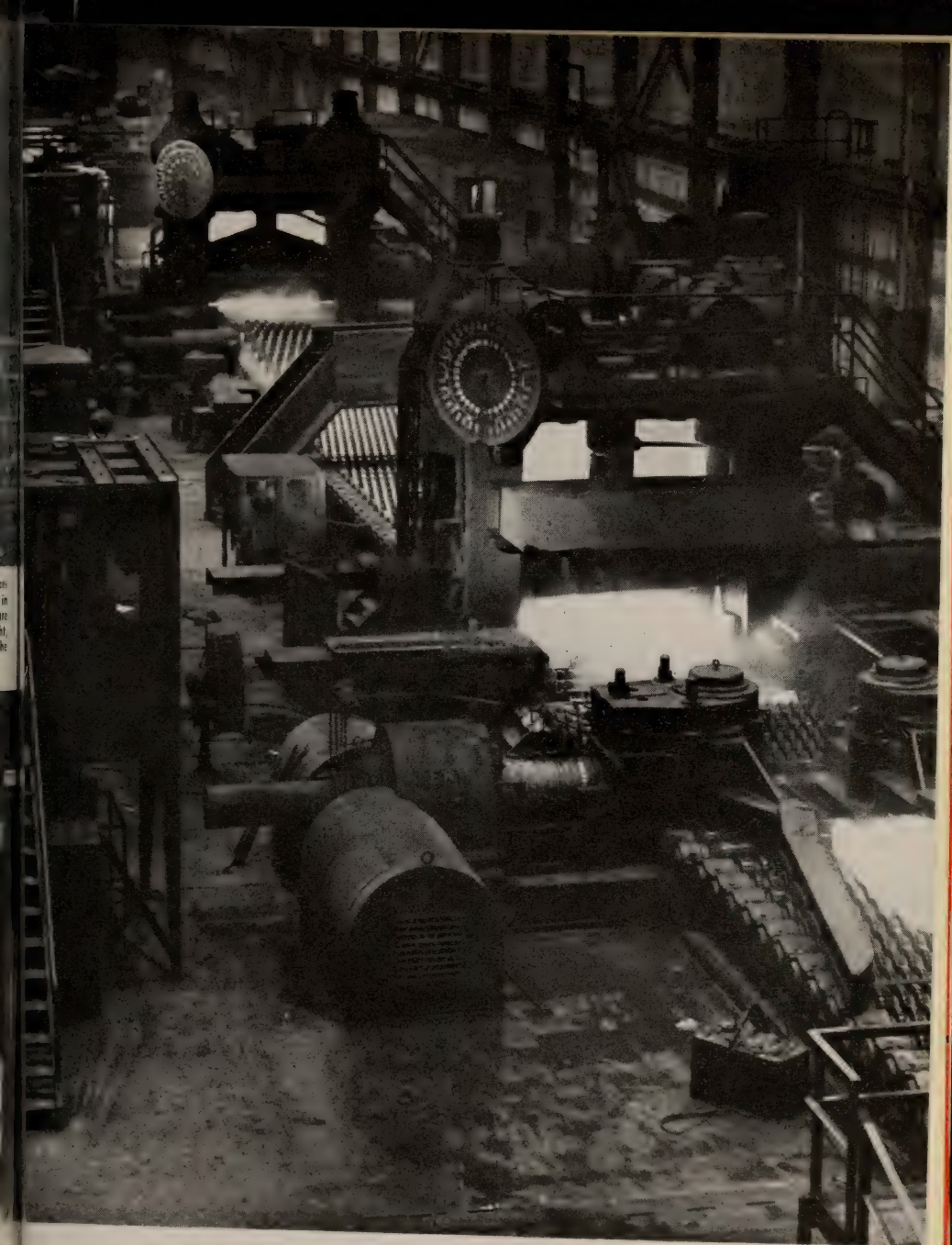
This is one of Uncle's latest air fighters, the P-51, Mustang. It is rated at over 400 miles per hour in level flight with a ceiling of about 40,000 feet and a tactical radius of 600 miles. The cockpit enclosure is of the 'teardrop' design with 360 degrees of visibility. The entire top can be rolled back at night, eliminating reflections from the instrument panel. Its high ceiling shows it to be turbosupercharged. The Mustang approaches the probable speed limit of propeller driven planes.



Photo: Courtesy General Electric Company

Here is the assembly line at the Fort Wayne turbosupercharger plant. An airplane engine must have oxygen in order to operate. The turbosupercharger scoops in and compresses the rarefied air of high altitudes. Operation is both directly from the crankshaft by a system of gears and by using the hot exhaust gases of the engine. The turbosupercharger provides near-sea-level air pressure to the motor, making high altitude performance possible. Here it is again: control, stability, tenuousness.





This plate rolling mill at Fontana, California, is rated at 300,000 tons of ship plate a year. You can count the number of men attending this installation on the fingers of one hand. Massive assemblies like this are fundamental and prior to most other industrial production but they are just as dependent on precise control. The power to energize them comes in over a thin, flexible wire, symbolizing the thin line of demarcation between advanced technology and the crudity of human toil and hand tools.

Photo: Courtesy Kaiser Company Incorporated



U. S. Army Signal Corps Photo  
 Here are some wrecked Jap power installations on Kwajalein Atoll after the 7th Infantry Division U. S. Army took over on January 31, 1944. The tenuous line has snapped under the impact of a superior technology bent on destruction. In these pictures some paradoxes of technology are illustrated. What applies to one, or a series of advanced technological mechanisms, applies equally to a social system that has become dependent upon technology and the conversion of extraneous energy for power to operate.



Photo: Courtesy West Coast Lumbermen's Association  
 'This is the forest primeval.' Virgin timberland in Oregon. In this raw physical environment it is hard to survive and prosper by human toil and hand tools alone. Under Price System operations social stability is extremely tenuous and easy to wreck. Destroy America's technology and the few survivors go back to nature's first principles. A technological society is easy to control by technological methods. Social stability comes from collective social interest. Social violence is TABOO in the Power Age.



# Canada: David or Goliath?

'3 Years, 3 Months, 3 Weeks and 3 Days'

by R. F. Novalis

## Go North, Young Man

How can a country like Canada *with only one-half of one percent of the world's population* produce 95 percent of the United Nations' supply of nickel, 75 percent of its asbestos, 20 percent of the zinc and mercury, 15 percent of the lead, and 12½ percent of the copper, to say nothing of 33 to 40 percent of the aluminum?

Canada can do this because of her high use of technology and energy in an area rich in resources. As *Modern Industry* magazine recently stated: 'Canada has developed her own know-how, her own technology.'

Back in 1939 Canada's central electric stations had 7½ million horsepower of turbines; at the beginning of this year Canada's hydro-electric power capacity was 10 million horsepower. This 2,500,000 added horsepower, plus 52,000 new machine tools are what have enabled Canadians to *produce* more minerals, munitions and machines in order to aid in defeating world fascism. Last year's all-time high output of electric power by Canadian stations was 40,377,000,000 kilowatt-hours, world's second largest electricity production. The largest was in the U.S.A., totalling over 220,000,000,000 kilowatt-hours.

A generally overlooked result, as in the case of the United States and Mexico, is that many of these new

production plants and facilities are going to be available for the use of North Americans *after* the war. For instance, there's—

1. The Shipshaw waterpower dam, with an installed capacity of 1,025,000 hp. and a potential capacity of 2,040,000 hp.
2. The Canol oil pipeline, completed this April.
3. The Alaskan highway, connecting the U. S. with Alaska through Canada, made available for travel in November, 1942.
4. The 10 new Crown companies owned and operated by the Canadian government, one of which, for instance, is Research Enterprises Ltd. Its 6,500 employees make optical instruments, *a commodity never before produced in Canada*, in a brand new plant (near Toronto) covering three-quarters of a million square feet of factory floor space. Besides its exclusively military products, it makes binoculars, clinometers, telescopes and cathode-ray tubes, all peacetime technological equipment.
5. Then there are the new rubber plants, but more of that later.

In war materiel, Canada's delivery of the 'goods' has made her fourth largest producer among the United Nations. Hitler has called Canada the 'richest prize of the British empire.' If it were not for the fact that we cut short their infiltration into Greenland a year or so ago, some of his Nazi airmen could have hopped from there to the northern part of this Continent.

### *Made In Canada*

A sample of the usefulness in this war of Canadian-made munitions\* and equipment were the 20,000 army trucks, armored carriers and ambulances employed in the Libyan desert to help route Rommel. Canadian ordnance plants turn out 350,000 artillery shells every month, plus 25 million rounds of small-arms ammunition. More figures are available and could be quoted at length if that alone were the measure of Canada's new productivity and future.

The war's pressure has increased Canada's basic steel mill capacity from 2,300,000 tons per year to 3,453,000 tons annually between December, 1939 and July, 1943. Actual output of steel ingots rose from 1,383,000 tons in the year 1939 to 3,000,000 tons last year. A new continuous strip-steel mill is being planned by the Steel Company of Canada, Ltd., which operates nearly

\*Canada's industrial productivity is so great that 70 percent of her war materiel is transferred to other Dominions, to England, Russia, and the U. S.

a third of the total national capacity already. Construction of the 300,000 ton mill may be started before the war ends.

For what purpose was the million horsepower Shipshaw hydro-electric dam built? Chiefly to supply the *extraneous energy* (in the form of electric power) required by the world's largest aluminum plant, at Arvida, Quebec, also new. The latter's capacity is one billion pounds a year. Canada also has her own magnesium plant.

Last January Canada's first synthetic rubber plant, owned by the government's Polymer Corporation, was put into operation. Its rated capacity, 38,000 long tons a year from butadiene, is greater than Canada's normal peacetime imports of natural rubber from British and Netherlands East Indies. And if you haven't already lost the cherished illusion that Canada is the 'land of ice and snow,' know that Canada is now growing rubber too. The Department of Agriculture gets an average of 5,100 pounds of crude rubber from each acre of kok-saghyz (Russian dandelion) planted in the 'eight experimental stations across Canada.'

### *Technology Is Thicker Than Water*

Are Canada and the U. S. more interdependent now than ever before? We still have not equalized our exchange dollars nor abolished tariffs wholly. Industrially that boundary line has been violated and ignored during this war period more than at any time in its history in spite of all



the legal and traditional interferences of business and politics. Last year Canada produced 125,000 tons of nickel, an all-time high. In 1942 alone, our mutual interference-line was brushed aside by 1,100,000 tons of aluminum, nickel, copper, lead and zinc, and last year's deliveries southward increased about a fifth.

Canadian railroads already run on tracks in eight of our States. We supplied Canada with 2 million tons of steel last year to be added to her own 3 million ton output in making munitions. Every year Canada supplies some of our northern States with over 2 billion kilowatt-hours of surplus hydro-electricity. And we get 75 percent of our newsprint from Canadian forests. All these and more comparisons represent the *technological ties*—of highways, railroad tracks, pipe lines, high-tension power lines—between the 'world's two outstanding national entities in . . . technological production.'

Even our Price Systems are interwoven. Twenty-two percent of the capital in Canadian business is invested by U. S. citizens, and Canadians have a billion dollars of their own in U. S. businesses. There are 1,900 factories in Canada, an investment of more than two billion dollars, which are branches of U. S. firms. One U. S. life insurance company (Metropolitan) has more life insurance business in Canada than any Canadian underwriter. Anything affecting the Canadian flow of purchasing power and investment likewise affects U. S. business. That is because our two technologies are so

nearly alike and so interconnected.

Are Canada's technological trends similar to those of the United States? Take a single branch of one sequence, transportation, and note the long-term effect of efficiency in Canada's electric railways alone:

	1939	1941
Passengers carried . . . . .	792,700,000	795,170,000
Freight carried . . . . .	2,873,000 tons	3,265,500 tons
But total main track operated was down from..	2,071 miles	to 1,519 miles
And employees from . . . . .	18,340	to 14,800

For more complete data on U. S.-Canadian trend comparisons see the May, 1940, issue of *The Technocrat Magazine*.

Have the U. S. school textbooks and newspapers educated us about Canada or the Canadians? One of those Gallup polls recently found that only 8 percent of the U. S. citizens interviewed could name Canada's population within a million, a fifth of them stating it was over 50 million, and that nearly three-quarters of the interviewees had the strange idea that Canada pays taxes to England.

It is still a surprise to many people south of the 'line' to know that all of Canada's population is actually less than that of the State of New York. Or that 'Since 1927 there has been complete independence among the British self-governing dominions . . . (due to) the Statute of Westminster.' (*Nation's Business*, special Canadian issue, May, 1941) Or, that to enter Canada from one of our largest cities (Detroit) you go *south*.

Then there was that dispatch from a Chicago newspaper correspondent in Edmonton, Alberta, dated November 16, 1942, headed 'JOIN U.S.? NOT A BAD IDEA, SAY MANY IN CANADA.' In it was one paragraph which read: 'And how does another ordinary fellow feel? Here's a train conductor: "I'm a Canadian born and bred," he said, and he had on seven 5-year service bars. "But that little imaginary boundary line down there has been a pain in the neck to me all my life."'

The officer chosen this May among all United Nations leaders to be administrator of the European liberated-territories is an engineer-general of the Canadian Army, Lt. Gen. A. E. Grassett, Canadian-born member of the royal engineers.

### *Defense Is Continental*

This March Canada's relations with the third largest nation on this Continent, Mexico, had reached such a degree that Prime Minister Mackenzie King announced that an ambassador had been appointed to represent Canada at Mexico City for the first time, in the person of Mr. W. F. A. Turgeon. And the Mexican government decided it was time to reciprocate, sending Dr. Francisco Del y Caneto as ambassador to Ottawa. Why not? You can board a Canadian train in Canada and with one change (in Chicago) step aboard a Mexican-bound train.

All these are but evidences of a trend culminating in a single, unified

Continent. Howard Scott said in November, 1940, a year before Pearl Harbor, that:

'The citizens of the United States had better realize that we have a Continent to defend, not merely a country. . . . In order to defend adequately the Canadian territory, the government of the United States must be prepared to undertake a gigantic program of highway construction in Canada . . . in order to provide . . . access to our bases in Alaska and Labrador.'

Technocracy Inc. had been banned as an organization in Canada on June 21, 1940, but Technocracy in the U. S. that year prepared and published maps, showing the location of a defense base needed in Hamilton Inlet, Labrador, as well as a highway to Alaska through Canada. During the following year all other organizations, including the press and political parties and those 'committees,' debated and threw opinions back and forth across the country as to whether we could be attacked, needed defense or not, and why we shouldn't do anything. In the meantime Technocracy was quietly investigating the facts, publicly proposing and describing definite measures for Continental protection, only two of which are here mentioned.

On October 15, 1943, Prime Minister King himself announced that Technocracy Inc. was once more legal in Canada. In the intervening 3 years, 3 months, 3 weeks and 3 days these two and many other proposals originated by Technocracy had been



found vital and were carried out. Whether by their efforts or not, to Technocrats the net results toward Continental safety were and are the important factors. However, the overall prime proposal of Technocracy then and now, Total Conscription, has yet to be adopted in order to insure that we will win the peace for America.

When Howard Scott's statement appeared in the November, 1940, issue of *Technocracy* magazine, no attention was paid to it by the press or the public, busily engaged in argumentation while the German and Japs, as Technocracy warned, were preparing to attack.

#### AS REGARDS DEFENSE PROBLEMS, THE NORTH AMERICAN CONTINENT IS A UNIT.

These are the exact words in which one of our most popular Price System weekly magazines, in its December 25, 1943, editorial page, finally comes around to locking the barn door more than 24 months *after* that December 7—the day we found the horse was gone.

What were *you* reading back in November, 1940? What are you reading *now*, aside from this particular issue of this magazine? Do you know where you're going, where your Continent is going?

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In the next issue this series will be completed with some interesting information about the countries around the Caribbean Sea, the Technate's tropics.

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### Social Ceiling Zero

Monsieur Mossoni at Ste. Hyacinthe, Quebec, Canada, in 1937 stated:

The politicians can talk of the greatness and prosperity under such and such form of government. What we want, and what we shall work to attain by all our means, is a State completely Catholic, because such a State can only present the ideal human progress, and because a Catholic people has the right and the duty to organize itself socially and politically according to the tenets of its faith.

As reported by Senator T. D. Bouchard (Liberal, Quebec) in his charge in the Canadian Senate, June 21, 1944, and published in the *Vancouver Sun*, Thursday, June 22, 1944.

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'The really dangerous American fascists are not those who are hooked up, directly

or indirectly, with the Axis. The FBI has its finger on those.

'The dangerous American fascist is the man who wants to do in the United States in an American way what Hitler did in Germany in a Prussian way.

'The American fascist would prefer not to use violence. His method is to poison the channels of public information.'—Vice-President Henry A. Wallace in *Democracy Reborn*.

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University of Denver researchers who recently quizzed citizens about the United States Bill of Rights reported that:

(1) 23% had never heard of it. (2) 39% could not identify it. (3) 15% gave hazy or wrong definitions. (4) 23% were reasonably acquainted with the first ten amendments.—As reported in *Time*, May 22, 1944.

# Planning With Bathos

by Herb Graffis

Reprinted by Permission of *The Chicago Daily Times*, May 29, 1944

An example of talking and thinking without fully considering the facts was presented in Congress recently when a million dollars was appropriated for the purchasing and training of Seeing Eye dogs for blinded veterans.

Certainly everybody wants to do everything possible for blind veterans and civilians. And it is certain, too, that the tragic triumph of the blind person and the Seeing Eye dog is something that reaches right down into your heart.

Nevertheless, the emotional factor, to put honest emotion on a practical basis, has to take into account a few fundamental facts which Congress apparently skipped.

In the first place there have been to recent date 73 Americans blinded in the war. Of these about 10 percent, according to competent authorities, will be able to make use of Seeing Eye dogs. The cost of buying and training a Seeing Eye dog is approximately \$1,000. The dog's life in Seeing Eye service is seven years. The life expectancy of the blinded veteran is about 30 years. So, say that a blinded veteran could use five Seeing Eye dogs during the remainder of his life, the appropriation per individual would be \$5,000.

Medical authorities estimate that even with heavy casualties still to come the number of blinded veterans

will be around 250. High explosives in this war kill rather than blind when they land nearby. The same 10 percent of sightless veterans will be able to make use of Seeing Eye dogs. That means 25 Seeing Eye dogs with five replacements per owner will be required. The figuring winds up with \$125,000 being the closest possible estimate of the amount required in a Seeing Eye dog appropriation for veterans.

Yet one congressman got up and said the million dollar appropriation isn't enough. Emotionally the fellow is O.K. but the great trouble with a lot of this business involving planning for veterans is that it is stampered by fellows who are temperamentally as stable as the boys in the old time saloon backroom who used to sob in loud anguish when the singing waiter gurgled a mammy song.

It is to be doubted that legislators of such dispositions are qualified to direct use of a million dollars so it would be most effective for blinded veterans.

Having stumbled over dogs around my house ever since I can remember I sure am for a Seeing Eye dog proposition for veterans. But, plus a lot more evidence of realistic use of a million dollars or any much larger amount of money in reclaiming a good part of the future for blinded and otherwise incapacitated veterans.



# I Test Flew the Flying Wing

by Clyde Pangborn

Condensed and Reprinted by Permission of *Flying Aces Magazine*, June, 1944

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**A famous pilot tells how the revolutionary craft flies and speculates on what it can mean in the postwar aviation picture.**

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In my opinion—and that is from the pilot's point of view—the most practical and already proven means for substantial improvement of the airplane both in economy and safety is through the greater development of the flying wing or lifting fuselage type of design.

The extensive official flight tests and operations which I have conducted with Vincent Burnelli's design here and abroad have convinced me of this.

For the excellent flying qualities of this multi-engined design are based on details and structures which, in the flyer's eyes, are of first importance.

The propellers, you will note, operate close together with no body between, strikingly different from a conventional manner. The advantage of this quality, though obvious for flying with one engine stopped, is immediately noticeable in the more efficient control qualities of the plane; for the corrective use of the controls to overcome the offset propeller thrust augmented by the drag of the stopped propeller is practically nil, and right or left turns are easily made.

This factor is exceedingly important in view of the U. S. Department of Commerce requirements that a twin-motored plane must be licensed according to its ceiling and payload capacity, when operated with but *one* of its motors and under satisfactory control characteristics. For, after all, practical flight on one motor, with safety, is one of the prime purposes of multi-engined design.

The broad airfoil of the flying wing is surrounded by all of the major load-carrying structure. . . . The wing beams are across the ceiling. The landing gear structure is at the sides, unlike the long tubular-fuselage construction of the conventional air transport, which is mainly a streamlined housing for the cabin section. The main load-carrying elements do not contribute to strength in a conventional job. . . .

The landing gear and tail wheel of the design contribute no direct shock to the lighter outboard wings or tail structure; the strains of landing and taxiing are directly applied to the deep-sectioned body and not on the more delicate wings and tail elements, as is done in the more conventional design.

That the body actually lifts a large percentage of the gross weight, as approved by the N.A.C.A. for design purpose, lessens the required area of the wings and relieves them of load,

with substantial relief of bending stresses throughout. The peak of the lift forces is in the center of the airplane, instead of being reduced in this critical load section by the addition of a non-lifting body element.

The body of the Burnelli UB-14 model supports 3400 pounds, or twenty-five percent, which is equal to the body structure plus the engine weight. It is understandable that the craft rides easily through rough air, maneuvers with less shock and landing strain throughout, and that such compactness of weight provides better stability and control qualities in operation. . . .

A notable quality of the design in the matter of safety is the fact that in operation over water, the wide body, which is water-tight, will serve as a boat bottom and float indefinitely. The body provides adequate buoyancy and has the stability required to serve as a life raft. The wings themselves easily can be arranged for quick release, to achieve this purpose entirely. And, since it is generally recognized that the land plane is of higher performance and economy than the more cumbersome flying boat, which depends on side floats for marine stability, an aircraft with the qualities of both is certainly superior.

With so much to be said on the credit side for the all-wing type of airplane, the question must be raised as to *why* it has not been put into use. The answer must lie in the resistance to change from the conventional designs to which everyone is accustomed.

Many analogies can be pointed out. The use of brakes for stopping, the tail wheel, hydraulic shock absorbers, controllable-pitch propellers, the cantilever monoplane, the wing flap, all-metal construction and other conceptions had been put into use and proved many years before they were generally accepted and incorporated concretely into the airplane.

But the flying wing, in practicality, flyability and usefulness is worth as much and more than these, once it is finally accepted as part of the aviation picture.

One of the fields almost immediately open to this type of plane is that of air freight. In postwar reconstruction, the ability to get materials to where they are needed—with economy and expedition—will be one of the most vital necessities. Air freight is the ideal medium. And new equipment to sustain the construction of the manufacturing industry during its conversion period and after will need freight carriers larger than those that will be left over from the war. The volume and weight carried by air must be comparable at least to that carried by a long distance truck.

As a pilot, it is logical for me to regard as a matter of great importance the fate of the military pilots after this war. That is one of the reasons I'm blowing a horn so loudly for air freight after the war—and for the flying wing which seems so ideally suited to freight carrying and so suited to what a pilot wants in what he's flying.

I'm going to reminisce a bit about



what happened after the last war. The difficult period of readjustment, with thousands of trained aviation personnel demobilized, was to some extent counteracted by the operations conducted by the exhibition stunt pilots and commercial barnstormers which a lot of World War I pilots became. It opened an earning field for aircraft operators and a market for some of the surplus military equipment which kept elements of the adolescent industry alive and active on conversion work and reassembly. . . .

But such matters as barnstorming will certainly not be with us to any extent after this war, now that aviation has become commonplace. It is an economic fact that aviation, in dollar volume, far exceeds the extent of the automotive industry during its peak years. The aircraft industry has now reached the beginning of its maturity and is far beyond the novelty stage it once held.

From the standpoint of economics, judgment concerning the competitive cost of air freight and truck freight

can be approximated from the fact that operating costs of air freight would be four times as much per pound or per hour as a long-distance truck. But if the *distance* travelled per hour is six times greater, the cost per ton on an equivalent load basis is less. In other words, the greater the distance, the less the cost. And, since air freight is practical for long hauls, it is much cheaper than any other method. . . .

Air freight is bound to come. In many instances, it is already here. And when it has finally grown beyond the initial stages, it is possible that the flying wing will be a tremendous factor in its development.

For this flyable, efficient, safe ship is one of the greatest factors to be considered in the development of air freight. From my own viewpoint as a pilot it is one of the best ships I have ever tested and flown.

We have the ships and the men to fly them. The rest is up to the future and it is my belief that the future of the flying-wing air freight carrier is very, very near.

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### What Is Freedom?

"Long after Pearl Harbor, German and Italian radio stations in the U. S. A. poured fascist propaganda into the ears of foreign-born Americans in their own language," Charles R. Denny, general counsel of the Federal Communications Commission told the Lea Committee of the House, which is investigating FCC's activities.

'Denny said that when war came there were 200 radio stations in this country broadcasting in German and Italian. These

were not short-wave stations, he pointed out, but standard wave-length stations which could be received on the ordinary parlor radio. Their programs were readily available to the 12,000,000 foreign born in the U. S.' From *P.M. Magazine*, March 22, 1944.

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'The human race is capable of the most extraordinary loyalty to unrealities. Otherwise there would be no professional politicians.' The late *Don Marquis*.

# Primer of Technocracy

by Education Division 8741-1

WHAT IS TECHNOCRACY?

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Extraneous energy, that is, energy derived from sources outside the human body such as coal, oil, gas, wind, falling water and the power of work animals, has always played a fundamental role in the progression of mankind and in his social life. Its role is becoming more important every year. America is in the Power Age now. The impact of energy and technology has torn our social structure loose from its ancient mooring. We cannot go back and to go forward requires designed direction along scientific lines. This series of articles constitutes an elementary introduction to the social aspect of science, the body of thought called Technocracy.

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## *Background*

'The social highway of history's yesterday is lined with the grave-stones of organizations, movements and human ideas that have lived and died. Hitherto in man's social history all movements which might have led to the improvement of man's well-being have been predicated upon a moralistic, philosophic preconception that by expropriating control from the dominant exploiting interests and acquiring their methods of exploitation, the products of any scarcity economy could be more equitably distributed. All of these movements in the past and today have been based upon the theory either that all social problems could be solved and that all social conflicts could be resolved by reducing the conflicting opinions to a common consensus, or that a transfer of title or possession or use from one group to another would work a social miracle; while

in other social movements has arisen the fanaticism that only one horizontal stratification of the social structure was entitled to usher in the pet utopia of their belief—their economic salvation of the human race.' From *A-1 Technocracy Magazine*.

These organizations and movements of the past and present were and are but attempted physical projections of imaginary things which have no existence anywhere in the external environment. They proceeded from the reflecting brains of great thinkers and the sympathetic hearts of great humanitarians. With due credit for their intentions, nevertheless their ideas were naught but personal interpretations of abstract concepts, arising from out of that illusory dream world of the inner consciousness. No wonder they passed back and must always so revert to the nothing from whence they



came. It is possible to project a physical thing into the inner world of imagination and make it do all sorts of funny things there. One can jump over the moon in the imagination. But it is not possible to project a purely imaginary thing into the physical world and endow it with reality because it didn't exist in the first place.

The world about us comprising our external environment is a world of things and events, of uniformity and physical laws. It is the interacting relationships between this world and the struggles of man for existence and expression that constitutes the nucleus of his major problems on this earth. As man learns more and more about the physical world, he becomes better able to adapt himself to it, and thus survive and prosper in it. The inner world of consciousness is too often used as an escape from the outer world of reality. Any attempted solution of social problems in America must be predicated on these facts. This approach need not conflict with any one's religion since, in its essence, the latter is a feeling and expression of veneration toward a superhuman power that is placeless and timeless, while social problems are a human thing of the here and now.

### *Characteristics*

Technocracy's plans are technological in design, based on the facts of physical science. Man's hope for a greater future on this Continent must derive from an extension of the

principles of science to the operations of the social order. All moral, political and philosophical approaches to America's social problems are thus invalidated at the outset. Technology has solved the problem of production. Within the framework of science from which technology arose lies, also, the solution to the problem of distribution. Technocracy Inc. by means of arduous, factual research has worked out this solution. It has coordinated into an overall design of social operations a scientific system of society, wherein the general welfare of all the human components involved is of paramount importance.

The body of thought called Technocracy, like science, can be defined as threefold, that is, static, potential and dynamic. In the static sense, Technocracy is a body of verifiable, factual data, pertaining to American social problems. Potentially, it is a set of deduced conclusions and induced principles elaborated from this data. Dynamically, Technocracy is the application of these conclusions and principles to the problems of the American social order, so as to indicate solutions to those problems, and point out the most probable results that may be expected from the impact of energy and technology upon society.

In effect, this means the next most probable state of development of the social order. So it can be said that Technocracy as a whole is the scientific methodology for the determination of the most probable social adjustment between man and his physical environment on the North

American Continent. Thus, it is seen that the salient characteristics of Technocracy parallel the nature of science. The difference is in degree and scope. Science is all verifiable knowledge relating to all things thus far known in the physical universe. Technocracy is all of science in its relation to social problems. In other words, Technocracy is the social aspect of science. Its field is limited to the bedrock of measurable social problems. Technocracy is dedicated to the scientific organization and ad-

ministration of modern civilization on this Continent with reference to physical operations, such as: Agriculture and manufacturing, which includes all products of the forest, mine and sea, Transportation, Communication, Education, Public Health and Social Welfare. These are real and measurable because they and man and their relation to each other all exist in the physical world about us. They are the major means whereby we live in a modern society.

*Next Issue: Methods of Technocracy.*

### Income Groups In Wartime

Over a third, 34 percent, of all families in the United States had incomes of less than \$1,500 a year in 1942. More than half, 53.5 percent, had incomes of less than \$2,000. Nearly two-thirds, 65.7 percent, had less than \$2,500.

This was the estimate, June 27, 1942 of the Office of Price Administration, Division of Research, in Estimates of the Distribution of Consumer Income in the U. S.

OPA estimated the distribution of the 32,650,000 families in the U. S. in 1942 by income groups as follows:

Over 1,400,000 families or 4.3% had incomes less than.....	\$ 500.00
Over 3,300,000 families or 10% had incomes less than.....	750.00
Nearly 5,800,000 families or 17.7% had incomes less than.....	1,000.00
Over 11,000,000 families or 34.0% had incomes less than.....	1,500.00
Nearly 17,500,000 families or 53.5% had incomes less than.....	2,000.00
Over 21,400,000 families or 65.7% had incomes less than.....	2,500.00
Only about 2,600,000 families or 8.0% had incomes more than.....	5,000.00
About 903,000 families or 2.0% had incomes more than.....	10,000.00

For the lowest third of the families, or those with incomes of less than \$1,500.00, the average income per family for the year was \$939.00.

"David E. Lilienthal, chairman of the Tennessee Valley Authority, explained here yesterday why he thinks that project can serve as a pilot plant in the development of resources for the entire United States.

"In most valleys rivers are a periodic curse," said Lilienthal, "but in Tennessee Valley we have harnessed floods and

changed the power which causes them into an asset.

"One thing about postwar planning that hasn't been adequately understood and emphasized is that natural resources are at the bottom of everything." As reported in the *Chicago Sun*, May 1, 1944.



# Technocracy and Your Trade

The School Teacher

by Anne Laurie

## *Teacher Is Tired of Apples*

This total technological war is causing an upheaval in what is perhaps one of our most important institutions, the public schools. For the lure of big salaries in our war industries is causing an exodus of our extremely low paid public school teachers into war jobs. This exodus will have an adverse effect upon the educational competency of the next generation of Americans.

Do you know what the salaries of the public school teachers are? The average annual salary of public school teachers in all States in 1940-41 was \$1,470.00. Because each State controls its own school system, however, the range in the various States was very great. The average in Mississippi was \$568 per year, while in New York it was \$2,591. The one-teacher rural school average salary was less than \$700 annually. Increases since 1941 have been very small indeed. The larger cities of 100,000 or more population were offering in 1943 from \$2,100 to \$2,399 for 48 percent of the vacant positions, \$1,800 to \$2,099 for 37 percent and less than \$1,800 for 15 percent of the vacant positions. Nearly 8 teachers in every 100, or some 66,000, are paid less than \$600.00 annually. That's an average of \$50.00 a month, just as much as a

private in the Armed Forces of the United States receives. Only the private's \$50.00 is clear; in addition he is provided with food, clothing, housing, medical and dental care. The school teacher receiving \$600 annually has to pay for all of these necessities out of that \$50 per month. Is it any wonder that the rural turnover rate of teachers is 30 percent as compared to a turnover of 10 percent in the larger cities?

In two years, 1942-43, almost one-third, or 31 percent, of its trained staff was lost in the public school systems. Almost all of these teachers had spent from 2 to 4 years training to become teachers and had had one or more years' experience. In October 1943 in the United States we had to abandon 15,200 teaching positions because no teachers could be found to fill the jobs.

The attraction of higher earnings in war industries was luring teachers from the positions for which they had been trained. As a result, in the school year 1943-44 about 7 percent of our total teaching staff had less than the amount of training required for the lowest regular certificate. And, the teaching of children by persons not qualified for the work is second in seriousness for the children only to closed classrooms.

### *Skinflint School Boards—Attention!*

As Benjamin W. Frazier in *Survey Graphic Magazine* for September 1943 in an article entitled 'The Teacher Shortage' puts it:

During the new school year, probably more than 300,000 school children will be without teachers for prolonged periods. Possibly 1,000,000 pupils will have teachers who are unable to meet the State certification requirements in effect before Pearl Harbor. Several million pupils will be taught by teachers whose qualifications are below the average of pre-war years. Recent national and State studies indicate that unless quick action is taken, even worse conditions are to be expected as the war continues. Investigations by the United States Office of Education, the National Education Association, show a steadily deepening crisis in the staffing of the public schools.

What, if anything, has been done to stop this exodus of teachers from the profession for which they have trained themselves? Some attempt has been made to alleviate the worst conditions prevailing. In cities of 100,000 population or over, the most important method used was replacing men with women. In all other types of school districts, the most important method was raising salaries locally.

Since the war began in Europe, teachers' salaries have risen an aver-

age of only about 8 percent whereas the cost of living has risen approximately 22 percent and wages in war industries more than 40 percent.

### *The Price System Must Maintain Scarcity in Education Also*

Education is neither a State, city, nor rural problem. It is a national problem and if it is to be adequately handled so that children receive proper education, it must become of national concern and must be solved by national regulation. The *Chicago Sun*, October 9, 1943, made this very clear:

The education of American youth is, to a large degree, a national concern. Illiteracy in the poorer States is not their burden alone; it is the country's burden. New York and Illinois suffer when a Georgia "cracker" child is deprived of a sound elementary education. The ills of ignorance cannot be quarantined.

Nothing has been done to raise salaries on a national scale. Elementary school teachers in the Chicago public school system are still on the 1922 schedule of pay, most inadequate as any one knows to meet the higher living costs of a war economy.

The deplorably low pay of our public school teachers, aggravated by the war deductions, has not been much publicized by the teachers themselves. They are more reluctant than non-professional groups to press their claims for more adequate com-



pensation. There is a widespread feeling among them that since the public owns the schools and foots the bills for the educational service provided, it should see that the teachers who render such services are fairly compensated. The long-suffering teachers of Chicago waited until Christmas eve 1942 before receiving the announcement that the final 5½ percent of the 23½ percent salary cut which they had taken in 1932 and 1933 would be restored in 1943.

A very large number of children will receive a poorer quality of education because they are being taught by any one who can qualify for an emergency certificate, and this condition is apt to continue into the postwar period, for with the greatly decreased enrollment in teacher training institutions, the normal supply of new, well-trained teachers will be very small for a number of years. The period of poor teaching will therefore be prolonged after the war

unless, of course, both the public and the teachers decide something can be done about this situation.

### *The Solution Must Be Scientific*

Something can be done, of course. The installation of the design of Total Conscription would at once place the trained teachers who have already had experience back into the jobs they were forced to leave because of low pay, for no longer would there be the low pay. Under Total Conscription the school teachers would receive pay commensurate with their work in the social welfare of American children, as well as food, housing, clothing, medical and dental care, even as the men in the Armed Forces receive. Education would be treated as a national problem, and the solution would be continent-wide; the same type of schools and education would be available for all American children.

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### **Anybody Can Pose A Problem**

'The supreme question which confronts our generation today—the question to which all other problems are merely corollaries—is whether our technology can be brought under control. Is man to be the master of the destructive energies he has created, or is he to be their victim?

'This, then, is the problem—far more immediate and acute today than it was 20 years ago. It cannot complacently be left for time to solve. We cannot count on geologic ages for the development of methods of social control. What we do in this generation and the next may well decide

the kind of civilization, if any, which is to dominate the globe for centuries to come. We now have it in our power to tear the world to pieces whenever passion and emotion call the tune. We must hope that we have it within our power, too, although the opportunity may slip from our grasp not soon to be regained, to make this Frankenstein creature which we have built, the servant and not the master of the people.' Raymond B. Fosdick, President of the Rockefeller Foundation, in his Annual Report for 1943.

# Technology Marches On

More Power + Less Work = Abundance

by Research Division 8741-1

## Engines—Not Muscles

Project 'X'—the world's largest internal combustion engine factory, operated by the Aluminum Company of America, was completed last year. Complete data on the engines powering this aluminum-reduction plant were published in the technical press, but only now has its *location* been revealed . . . Hot Springs, Ark., which is near the source of raw materials.

This plant is operated by the following units:

- 50, 1,165-horsepower spark ignition natural gas engines, and
- 18, 3,600-horsepower Diesel engines.

This amounts to a total installed capacity of 123,050 horsepower. Among factories, only the Ford River Rouge auto plant has more installed prime movers, but they are in the conventional steam turbine units, as are most electric power stations.

Americans use engines for everything. By building six 6,000 horsepower electric motors and installing them in buildings designed for their use at Moffet Field, California, we are now able to test full-size airplanes for the first time, instead of scale models as heretofore. The buildings house the National Advisory Council for Aeronautics' new wind tunnel. Forty-foot, six-bladed propellers are turned by the six big motors to create arti-

ficial winds that can test new designs for planes up to 80 foot wingspread (twin-engine bomber size).

The Continental Can Company's plant at Clearing, in Chicago, is producing 5,500,000 cans per day. At that, it is operating at only 60 percent of its 24-hour capacity (*Chicago Herald-American*, June 26, 1944).

One of the latest refineries to be completed during the war is at Lake Charles, La. It required 25,000,000 man-hours to construct and over all its 600 acres the maximum employment will be but 1,500 people. Its production comes not from the power of the 150-horsepower total muscle-power the employees are capable of; rather, the two 25,000 kilowatt electric generators keep things going. What is the resulting overall plant capacity?

Sufficient butadiene to supply 10 percent of the nation's normal synthetic rubber.

Sufficient high-octane gasoline to send 1,000 bombers over Germany daily; approximately 2,000,000 gallons per day.

Sufficient vehicle gasoline to roll three armored divisions a distance of 100 miles.

The new Owens-Illinois Glass Company's plant at Waco, Texas, has a



capacity of 330,000 glass bottles per day. Only five machines are needed to do the work.

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Only 300 people will be needed in the United States Rubber Company's new rayon tire cord plant at Scottsville, Va., to control the machines that will have a capacity of 12,000,000 pounds of rayon cord per year. The plant will be completed in October, costs \$2,250,000, which was put up (through the Defense Plant Corporation) by the people of the United States.

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In Champaign, Illinois, University of Illinois research chemists have discovered a new way to join layers of synthetic rubber tires used in heavy bomber planes. Although efficiency is reduced 5 to 10 percent, the new process cuts time for joining the layers from 10 hours down to 10 minutes.

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Last year U. S. Domestic airlines flew 78 percent more ton-miles of airmail letters, 34 percent more air express freight, and 10 percent more passengers than in prewar—using 50 percent fewer airplanes.

### *One H. P. Hour Equals 10 Man Hours*

Probably the chief reason why the farm manpower shortage is not as bad as it could be and it has not been necessary to ration milk, is the fact that farm milking machines were operated last year at a higher load factor than any other farm equip-

ment. Although the average milking machine was in use only 684 hours, the combined operations of all units did the work of 210,000,000 man-hours. (Source: *Agricultural Situation*, Jan. 1944).

At the start of last year our 4,600,000 farms having cows had between them only 310,000 milking machines. (The average machine in use was 8 years old.) During 1943, 125,300 additional single and double units were manufactured. But when you recall that:

1. There are 8,760 hours in a year, not merely 684, and
2. Less than one out of every 7 farms, having more than 2 cows, had milking machines—

then you can see how far we have yet to go in mechanizing milk production, as well as how much further we would have been ahead if we had had our farms mechanized before entering a war.

Yet, we can still go a long way toward raising our productivity and reducing unnecessary manpower, if we would raise the load factor on the machines we already have. Only Total Conscription can do that.

---

First 7 months of 1943 aircraft employees increased 4.4%. 1st 7 months of 1943 production increased 44%. In 1940 it required 440 men 1 year to build 1—B-24. In 1943 it required 17 men 1 year to build 1—B-24. In 1940 it required 232 persons to build a P-38. In 1943 it required 11 persons to build a P-38.—Figures taken from a speech made by Donald Douglas before the Board of Directors of the Los Angeles Chamber of Commerce, Sept. 9, 1943.

General Henry H. Arnold recently wired the Bell Telephone System:

'Directly as a result of your special electronic equipment the Army Air Forces has been able to take the offensive against Japanese shipping at a much earlier date and under conditions which normally would have made such operations impossible.'—From *Model Airplane News*, May, 1944.

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*Production of Electronic tubes* is now 11 times as great as in 1941.

*Production of electrical* indicating and measuring instruments essential to fight a mechanized war soared 3,900% since 1940—from 700,000 to 28,000,000.

*Seventeen thousand* airplane castings may be inspected in 24 hours by an X-Ray machine.

*Enough tin plate* was produced by U. S. Steel Mills in 1941 to form a continuous 30 inch strip well over 1,000,000 miles long, sufficient to provide a giant tin girdle reaching 40 times around the world, according to K. W. Brighton, American Can Co. research technologist.

*A house an hour* is the record of a San Francisco builder who produced 700 three bedroom homes in 700 hours.

From 500 rifle barrels per shift to 3,600—with no more people, and in about one-fifth the space. That is the increase in output achieved on a group of operations at the Springfield Armory.—From *Factory Management*, May, 1944.

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Photo-electric cells check hand grenades at the rate of 4,000 per hour. When a defective unit appears on the conveyor, the mechanism rings a bell, lights a lamp, puts a dab of paint on the grenade and makes a mark on a chart.—From *Iron Age*, May 17, 1944.

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'Solely from the angle of jobs the currently projected three billion dollars' worth of hydro-electric plants for the United States may cost workers \$100,000,000 annually in wages, the Bituminous Coal Institute said in a survey released today. . . . Coal miners alone stand to lose \$60,000,000 in wages yearly, \$40,000,000 to transportation workers and operators of coal-steam generating plants and others.' From *Detroit News*, Jan. 15, 1944.

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It has been pointed out that a man's age can be measured by the degree of pain he feels when he comes in contact with a new idea.

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### Where Was 'Free Enterprise'?

'The remarkable efficiency of wartime production of goods in such countries as the United States has been hailed in some quarters as proof of the continuing vitality and efficiency of old-fashioned capitalism. This is a highly superficial and misleading appraisal of the situation.

'In the first place, the impressive production has been due primarily to technical and engineering genius and not to any economic system.

'In the second place, the war and the Government demands suspended all but completely the very essence of capitalistic production, namely, the scarcity ideal and

the limitation of production in the interest of profits for the few producers. *For the first time, our economy has been compelled to comply with the ideals of the technology of abundance.*' (Italics ours) —Excerpt from 'The Economic Pattern of Tomorrow' by Harry Elmer Barnes, in *The Progressive*, May 22, 1944.

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Dr. Nicholas Murray Butler, President of Columbia University, recently stated:

'Engineering and medicine are the two most important intellectual occupations and will continue to be so in the future.' —From *Model Airplane News*, May, 1944.



# In the Question Box

By Public Speakers Division 8741-1

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**This department consists of actual questions asked and answered at Technocracy meetings, plus those sent in by readers.**

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Will the coming election make any difference in the final outcome of the Price System?  
A.M.

Very little, if any. The physical trends operating in America which are rendering the Price System invalid are technological, not political. The day when political methods can solve social problems is past. It has long been necessary for politicians to call in technicians for consultation. Social problems are technical problems. Politicians, of course, are interested in maintaining the status quo, at all times. To that extent their function is to sabotage the future of America as a whole for the sake of pressure groups here now. They have always performed that way and we can expect them to continue in that role. Nevertheless, the U. S. Government is the voice of the sovereign people. It will do what the people demand. To that extent it will make some difference in the final outcome of the Price System.

What is the significance of the fact that 40 percent of the million men who have returned to civilian life from the Army and

Navy do *not* want their old jobs back but want other and new jobs instead? R.F.

It's probably because they don't want to get back in the same old rut they were in before, but want to better their condition. Modern warfare is technological. The number of arts, trades and professions represented in the Armed Forces is fully as large as in civilian life. In addition, in time of war, the Armed Forces have first access to all the new technology. Also, for the first time in their life a large number of men get a chance to work at something they like and learn something new. The standard of living in the U. S. armed forces is higher than it is in civilian life for most soldiers. It is not strange that such a number of discharged service men dislike the idea of crawling back into their old ruts. They've had a taste of something better and want to find an equivalent spot in civilian life.

In the event that Total Conscription is installed, what will happen when the six months' period is over after the war ends? D.G.

Total Conscription automatically expires six months after the war is over. The only thing that will happen then is that we will return to our old dog-eat-dog social habits. If the people don't want to go back to mass unemployment, depression and

a hopeless existence, they can then indicate their desires to the Government. That is what the Government is for.

How would Total Conscription affect the men in the Armed Forces? K.N.

It would boost their morale a thousand percent overnight. It would give them the knowledge that no one could possibly make any money out of the war. They would know that the home front was on the same basis as the Armed Forces and that everybody was working together for the same thing. They would know that the country as a whole was being made into a better place to live in and return to than when they left it. This knowledge would fortify every man and woman in the Armed Forces immensely. Yes, Sir! Total Conscription would be good medicine for the Armed Forces.

Will money be worth its present value after this war; your personal opinion, please? A.D.

Opinions are worth about a dime a hundredweight and since they are all made up of hot air, it would take a lot of them to weigh a hundred pounds. Technocracy does not deal in such cheap merchandise. This speaker has no opinions about the value of money, and cares less. We

suggest that you buy the little booklet called 'The Mystery of Money.' Then you will realize that the point is not important.

I hear often that Technocracy is fascism, is that right? G.A.

No, that's wrong, according to the fascists themselves who call us communists. This old canard was spread by the various and sundry schools of socialism and communism in America to distract attention from their own little rackets; while the genuine native fascists spread an opposite story for the same reason. It's a cinch they can't both be right. Maybe Technocracy is just simply an all-American social movement. Have you ever thought of that? Look into it; it's important.

Would Total Conscription include the President and members of the House and Senate? N.B.

Yes, It would include every living person from 18 to 65 years of age, for all necessary duties, both civilian and military. However, Total Conscription would be administered by the present Government, and there would be no change in that respect. But, don't get the idea that Total Conscription is a scheme to get a fourth term for Mr. Roosevelt. The program of Total Conscription was published as early as July, 1940.

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### What Do You Think?

'On June 9, the third day after the invasion of France, "German sterling bonds were in demand" on the London Stock Exchange. In a day the German 5s (1942) rose from 8½ pounds to 9½. A student of European history asks if some big

money is being staked on a different view of Germany's future than the man on the street can now see.'—Excerpt from the column 'Here Is Chicago' by Robert Faherty in the *Chicago Daily News*, June 23, 1944.



# Straight From the Horse's Mouth

Read 'Em' and Wonder

by The Peripatetic Technocrat

I Should Keep In Touch With My Voters?

Three thousand letters a day go out of my office. Every time there's a birth, death, accident, hospitalization, induction or celebration in Chicago I write a letter to the family.

Mayor Edward J. Kelly of Chicago to Maury Maverick, ex-mayor of San Antonio, in answer to the latter's advice to Mr. Kelly to keep in touch with his voters. (As reported in Leonard Lyon's column in *Chicago Daily Times*, January 19, 1944.

This bill assumes to disregard my area . . . to try to centralize and to federalize and to control the raindrops, the fog and the dew . . . You cannot beat God. God knows you cannot stop floods by dams. You cannot beat nature or nature's God, no matter how smart you are.

Representative Chas. A. Plumley of Vermont, in opposition to a proposed \$30,000,000 Federal dam and power project in the West River Valley in Vermont. (As reported in *Newsweek*, May 22, 1944.)

Whereas two world wars in a single generation have demonstrated the urgent necessity of international collaboration for the maintenance of peace and justice among nations, and

Whereas the United States after attempting to remain apart from these wars has in defense of its own security been drawn into them at heavy cost in human lives and material wealth,

Resolved, that the General Federation of Women's clubs requests the President, the governors of the several states and each member of Congress to use their best efforts to advance the present price of crude oil 35 cents per barrel.

Part of a resolution adopted by the General Federation of Women's Clubs at its St. Louis convention recently. (As reported in 'Inside Washington,' a column in the *Chicago Sun*, edited by Bascom W. Timmons, June 20, 1944.)

The great need for food in the years following demobilization should make it both necessary and possible to distribute food in a fashion designed to maintain stable prices and markets.

Lt. Col. Ralph W. Olmstead, Deputy Director for Supply of the War Food Administration, before the 46th Annual Convention of the National Association of Retail Grocers in the Palmer House, Chicago, Illinois, June 5, 1944. He also said:

We are going to carry it out even if we have to dump the eggs in the ocean.

This was in answer to a question regarding the surplus of eggs and the Government's promise to support prices. (As reported in the *Chicago Tribune*, June 6, 1944.)

After the war everything will be obsolete every five years. Everything, just everything.

William B. Stout, famous Detroit inventor-designer, in an interview with the Press at the Hotel Pierre in New York recently. (As reported in *Newsweek*, May 29, 1944.) We wonder if the above statement by the ebullient Mr. Stout includes the Price System? He said 'everything.'

Social Security demands that each citizen give up his individuality, his integrity, his intelligence and his independence in order that he may share in the redistribution of existing wealth. . . . Much chronic half-sickness is the result of malnutrition for which the medical profession cannot be blamed. Any attempt to meet this situation on a nation-wide scale with so-called adequate medical care will certainly bankrupt our economy.

Dr. J. Craig Bowman, chairman of the Section on Miscellaneous Topics at the Annual Convention of the American Medical Association in the Morrison Hotel, Chicago, Ill. (As reported by Hazel Macdonald in *Chicago Times*, June 14, 1944.)

Unless sooner terminated this authorization shall expire at the close of the last day of the month immediately preceding the first month that begins six months or more after the date of the termi-

nation of hostilities in the present war.

An extract from the Federal Register of 'Exemption from Taxes.' (As reported in 'Inside Washington,' a column in the *Chicago Sun*, edited by Bascom N. Timmons, May 12, 1944.)

Would you give me the opportunity to fill the positions? I would guarantee it would be done without difficulty. I would like to have it. It would be good for the country.

Sewell L. Avery, Chairman of the Board of Montgomery, Ward and Company to Representative Moroney (Dem. Okla.) at the former's appearance before a Select House Committee investigating the Government's seizure of Ward's properties April 26, 1944. This statement was in answer to Moroney's question as to how Avery would go about improving the make-up of the War Labor Board. (As reported by Vance Johnson in the *Chicago Sun*, June 7, 1944.)

Scene: A North Shore collection center for Russian relief.

Time: Midwinter 1943.

Characters: An attendant at the center and a society matron.

*Society Matron*, bringing in some old garments: 'These are slightly torn, but may I donate them anyway?'

*Attendant*: 'We prefer not to accept such clothing because the Russians simply have no means of mending them.'

*Society Matron*: 'Even if I include a needle and thread?'

*Attendant*: 'Not even with a needle



and thread. But we'll be happy to list your name as a volunteer for our kit campaign, during which we do mend clothing for the Russians.'

*Society Matron:* 'Oh, I'd love that,

but I can't—my husband's a Republican.'

(Rewritten from a scene reported in Kup's column in the *Chicago Times*, December 20, 1943.)

### Three Strikes And You're Out

'Going around army camps and seeing the incredible jobs scientists, engineers and mechanics have done in the desperate emergencies of war is bound to make you think that if the same high genius were applied to preserving peace it would be virtually impossible to make war. But that fact hasn't been given due consideration by mentally deficient people who get into political power. Hence, these nuts compel mankind to concentrate on murder instead of on enjoying life. They get the suckers into the position of knowing that there can be only one of two answers, kill or be killed.' Herb Graffis, *Chicago Times*, April 23, 1944.

'Despite all the talk about economic planning by business, not one business plan looks forward to the complete utilization of our mechanical equipment for human service. All plans look back to profits—and bigger profits—at the expense of our economy and the public weal. Some of the plans have been so greedy and shortsighted as to alarm relatively enlightened businessmen like Charles Wilson.

'Most disconcerting of all, the great cartels and monopolies, and their Government stooges, are already under way in the effort to suppress the more notable scientific and technological advances of wartime, in the hope of defending their investment in, and control of, obsolete techniques and inefficient processes.'—Excerpt from 'The Economic Pattern of Tomorrow' by Harry Elmer Barnes, in *The Progressive*, May 22, 1944.

'We Americans are on the threshold of a great decision. We have to decide whether we shall go ahead, eyes open; or crawl back abed and pull the sheets up to shut out the lightning of change.

'Baker Brownell puts the situation clearly. "Our industrial society travels on two legs. One leg is 20th century technology. Its main function is production. The other leg is 19th century business administration and finance. Its main function is to assemble capital, facilitate exchange and, particularly, to administer distribution. . . . With one long leg and one short leg our industrial society travels in spurts and circles and then falls down. Then it gets up and does the same thing over again. This is solemnly called the business cycle; and nothing, say the economists, can be done about it."

#### *The Open Door*

'If nothing can be done about it, the future is black indeed. We shall repeat the dreary tale of idleness and "relief"—and on a vaster scale than before.

'But something can be done about it. Only the "something" will be nothing less than complete revision of attitudes. . . .

'We have willing hands and rich resources. The bloody fist of war has hardly touched us. In all its history, our land never faced greater opportunity for health, wealth and happiness. Nothing but our own stupidity can close the door on that opportunity. Only if we persist in looking backward will the history of the United States fail to have a bright new chapter.'—Excerpts from Howard Vincent O'Brien's column in the *Chicago Daily News*, May 29, 1944.

## THE OUTGROWN

by Ernie Crook

Reprinted from *Action*, April, 1944

Like an ox in modern traffic,  
Like a sword in modern fray,  
Or a scythe in modern harvest  
Is our scheme of buy and pay.  
Own and borrow, get and corner,  
Trade and barter, hire and loan,  
Taking interest, rent and profit,  
While our brothers sigh and moan,  
Millions idle, robots taking  
Jobs from living mortal men.

So our barns burst out with surplus,  
Goods that mean but mere refuse.  
Dead machines they eat not, wear not,  
They produce but never use.  
This sad scheme is dead and done with,  
Unless 'tis to patch and mend.  
Junk the system; spread the bounty,  
Bring this folly to an end.  
Let resources God has given  
Minister to mortal men.

### Contributors To This Issue

Herb Graffis writes a column in the *Chicago Daily Times*. He is not a member of Technocracy Inc.

Clyde Pangborn is a famous pilot. He is not a member of Technocracy Inc.

R. W. Herring is a member of R.D. 8342-1, Detroit, Mich.

The Peripatetic Technocrat; R. F. Novalis; and Anne Laurie are members of R.D. 8741-1.

Robert Bruce is a member of R.D. 8741-1, Chicago, Ill.

Articles by the various Divisions of 8741-1 are collective compilations.

The Marion, Illinois, Trades Council and Trades Body have affiliated with the Marion Illinois Chamber of Commerce. This was reported in a U.P. dispatch in the *Chicago Sun*, June 12, 1944. What, no class war?

### Information about Technocracy Inc. in the Great Lakes Area can be had at these Section addresses.

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8342-1—9108 Woodward Ave., Detroit, Mich.

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8844-3—135 Van St., Neenah, Wis.

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9439-1—817 Walnut St., Kansas City, Mo.

9648-1—Route 1, Box 2, Warren, Minn.

R. D. 9737—4442 Bayley, Wichita 9, Kan.



# TECHNOCRACY

## WHAT?

### WHAT?

★ Technocracy is the only American social movement with an American program which has become widespread in America. It has no affiliation with any other organization, group or association either in America or elsewhere.

★ The basic unit of Technocracy is the chartered Section consisting of a minimum of 25 members and running up to several hundred.

★ It is not a commercial organization or a political party; it has no financial subsidy or endowment and has no debts. Technocracy is supported entirely by the dues and donations of its own members. The widespread membership activities of Technocracy are performed voluntarily; no royalties, commissions or bonuses are paid, and only a small full-time staff receives subsistence allowances. The annual dues are \$6.00 which are paid by the member to his local Section.

★ Members wear the chromium and vermilion insignia of Technocracy—the Monad, an ancient generic symbol signifying balance.

### WHERE?

★ There are units and members of Technocracy in almost every State, and in addition there are members in Alaska, Hawaii, Panama, Puerto Rico and in numerous other places with the Armed Forces.

★ Members of Technocracy are glad to travel many miles to discuss Technocracy's Victory Program with any interested people and Continental Headquarters will be pleased to inform anyone of the location of the nearest Technocracy unit.

## WHERE?

## WHEN?

### WHEN?

★ Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers and economists that became known in 1920 as the Technical Alliance—a research organization. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the State of New York as a non-profit, non-political, non-sectarian membership organization. In 1934, Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present nation-wide membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

### WHO?

★ Technocracy was built in America by Americans. It is composed of American citizens of all walks of life. Technocracy's membership is a composite of all the occupations, economic levels, races and religions which make up this country. Membership is open only to American citizens. Aliens, Asiatics and politicians are not eligible. (By politicians is meant those holding elective political office or active office in any political party.)

★ Doctor, lawyer, storekeeper, farmer, mechanic, teacher, preacher or housewife—as long as you are a patriotic American—you are welcome in Technocracy.

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306 W. Randolph Street,  
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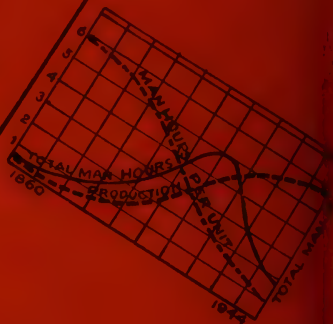
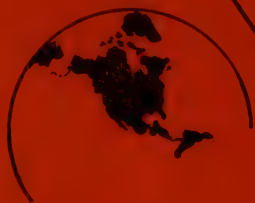
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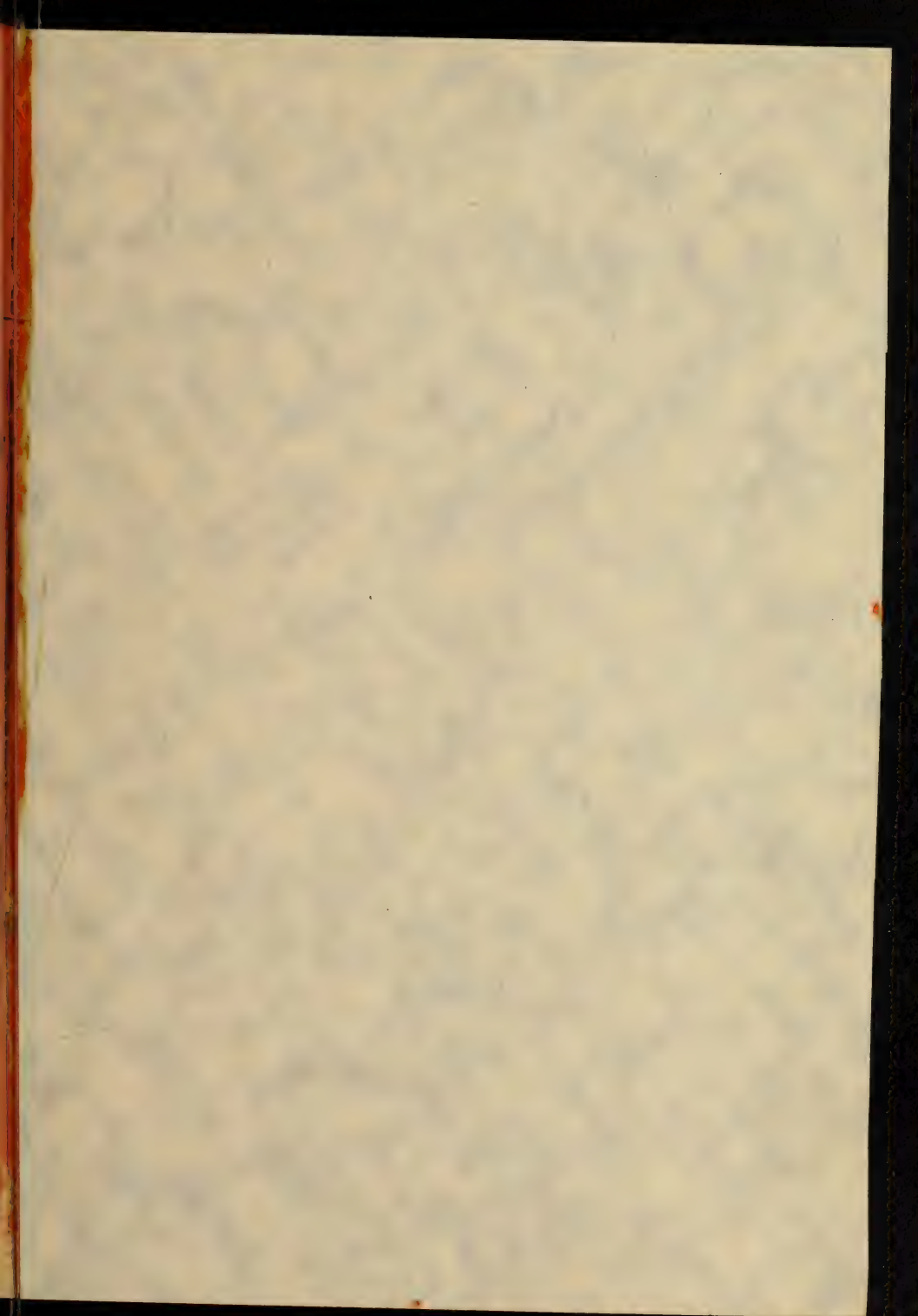
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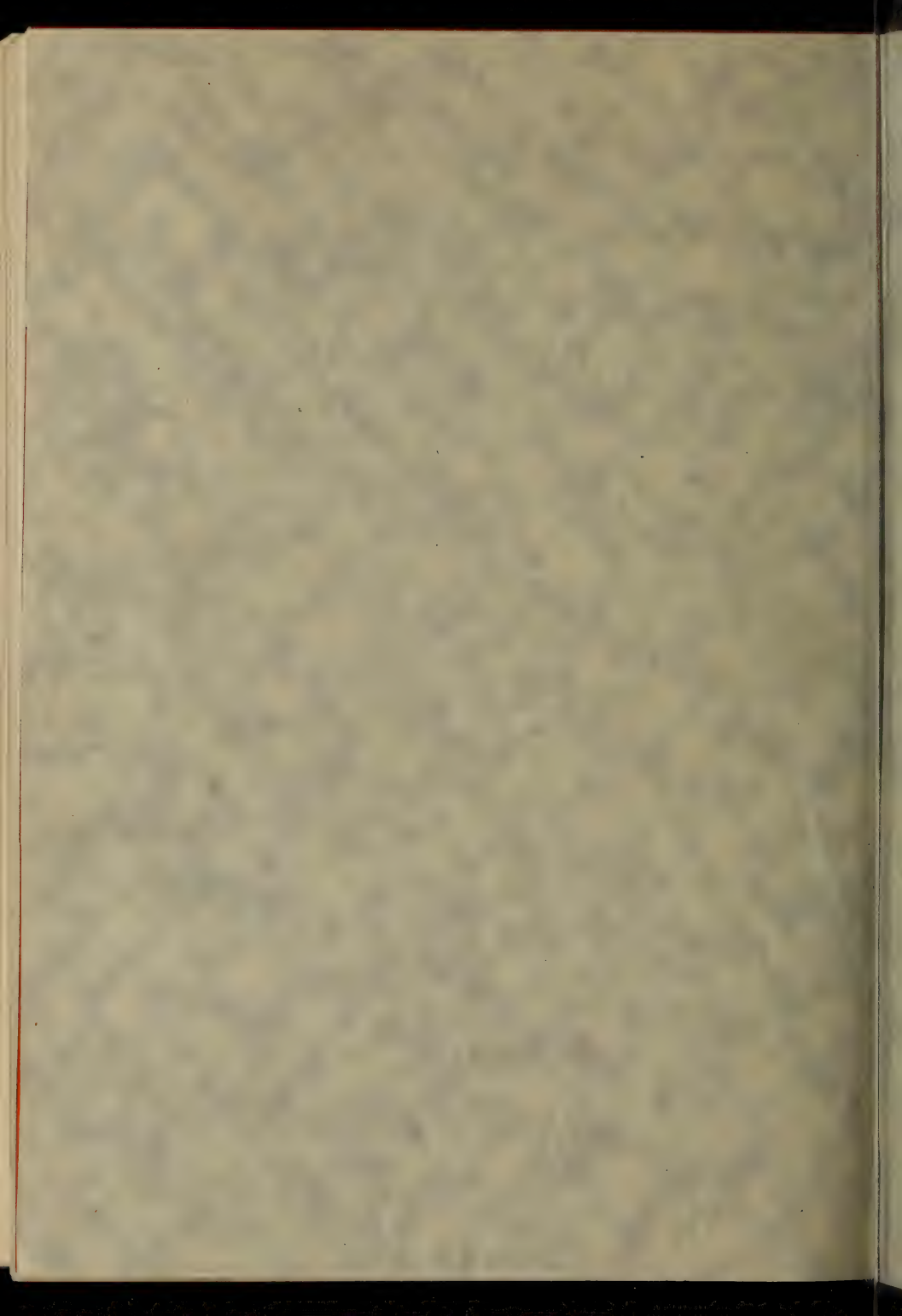
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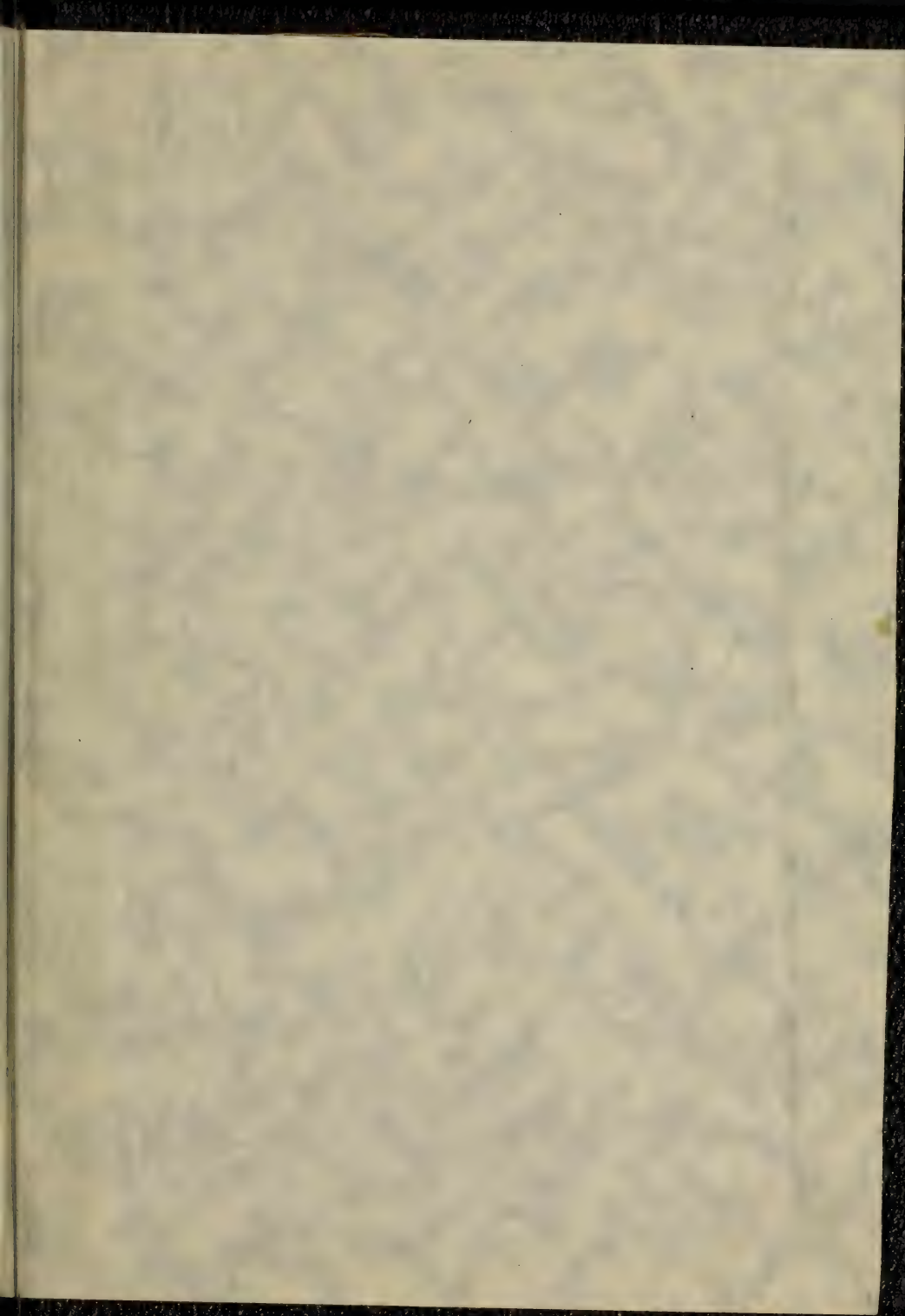
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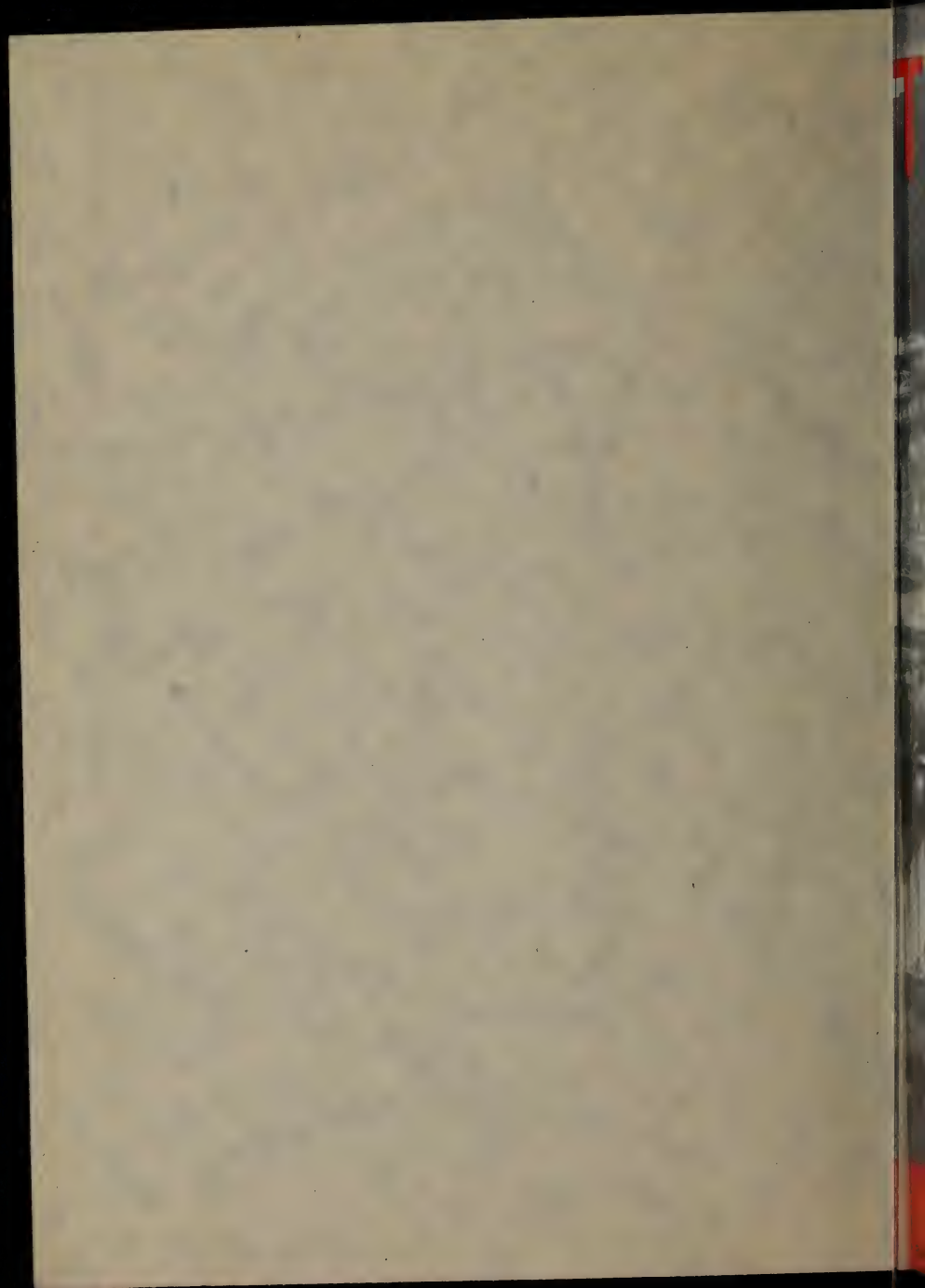




R. S. CAMERON









# TECHNOCRACY DIGEST

An aerial, black-and-white photograph of a sprawling industrial complex, likely a steel mill or a large manufacturing plant. The facility is characterized by a dense network of conveyor belts, structural steel frameworks, and numerous smokestacks emitting thick plumes of white smoke or steam. The layout is highly organized and complex, with various levels and interconnected structures. In the background, a large bridge or overpass structure is visible, spanning a body of water or a deep ravine. The overall scene conveys a sense of massive industrial scale and activity.

**SPECIAL SUPPLEMENT - 25c**

PUBLISHED IN CANADA BY SECTION 1, R. D. 12349, TECHNOCRACY INC.

# TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS  
COUNTRY FOR SOCIAL CHANGE

VANCOUVER, B. C.

84 A

SPECIAL SUPPLEMENT

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## FRONT COVER

The Grand Coulee Dam on the Columbia River is the greatest structure on the face of the earth. Technocracy, which proposes that things be done with a minimum of human labor so as to produce a maximum of physical wealth, would apply the technology which was used in the construction of Grand Coulee Dam, not only to the entire hydrology of North America, but to all of the pertaining end-products—the utilization of rivers; the transmission and distribution of power; and the use of the lands affected by the control of the water. To Technocracy, the job would not begin and end with the construction of the dam and power house. That would be only one link in a chain of functions for the attainment of a maximum of efficiency on this Continent.

—(BUREAU OF RECLAMATION PHOTO)



# Why Do You Vote?

**T**HIS month the citizens of Canada will cast their ballots in a Dominion election. Here are some questions that the people of this country should ask themselves as they go to the polls:

Are any fundamental issues being voted on—the kind that will drastically affect the social welfare of the individual citizen?

Which—if any—of the parties has a concrete program that will ensure economic security for all in the postwar period?

Does the act of casting a ballot provide much real freedom to the individual citizen today?

Can we have freedom without economic security?

Which—if any—of the parties has ever fulfilled its election promises?

Is a political platform merely something to stand on in order to get in?

What are the actual functions of political government? Does it do anything other than spend the taxpayer's money and act as a referee between capital and labor?

What does your vote do for

you?

Is 'counting noses' an efficient and scientific way of arriving at social decisions in the Power Age?

Will the winning party be elected by a majority of those eligible to vote? Has it ever been?

Has the candidate you are voting for any knowledge of the problems involved in operating a highly mechanized, tenuous, and complex society?

Would that candidate be likely to remove himself from political office if he thought it in the interest of the nation for him to do so?

Can any political party institute a planned economy of abundance on the North American Continent under the Price System?

Can we install a new social mechanism merely by marking X's on pieces of paper or do we need a trained disciplined organization—a Technological Army—to do the job?

The march of events within the next five years will force an answer to these questions.

—The Editor

# The Vultures of the Peace

*This war is a world conflict between two opposing policies — Rome and Moscow. How can you expect anything but an international double cross to come of San Francisco when the majority of nations invited are allies of the policy of Rome?*

THE technological weapons of total war have spread ruin and devastation halfway around the civilized world. In World War I the devastation of military conquest was mostly confined to the no man's land between the opposing armies. In World War II the airplane, the flying bombs and the rockets have carried death and desolation, destruction and demolition a thousand miles beyond the fighting front.

The industrial heart of Europe is comprised of that territory which includes eastern France, Luxembourg, part of Belgium, Holland, the Saar, the Ruhr, the Rhineland, Italy north of the Po, eastern Austria and Czechoslovakia, to its eastern frontiers in Polish and German Silesia. From out of this industrial heart of Europe flowed a production of physical wealth that was not only the lifeblood of Europe but reached the far corners of the earth. Never in the history of man has the devastation and de-

struction of the means whereby human beings live been carried so far and wide, never have so many habitations, public buildings and industrial plants been reduced to so much rubble.

The civilization of the world has been torn apart in the bloodiest, most devastating struggle of all time. This struggle had its immediate beginnings in the first Fascist political party propaganda by Mussolini and Hitler almost simultaneously in Italy and Bavaria in 1919. The opposing combination of forces first began to coalesce in the Anglo-French partition agreement of December 1917 which culminated in the erection of the Cordon Sanitaire. Historically, this conflict had its beginning 730 years ago when Pope Innocent III, a spiritual pontiff, became an international political sovereign and declared the Magna Charta null and void, deposed King John of England, and appointed Prince Louis of France to the English throne, to



be followed by the formal establishment of the Inquisition in 1230. This was the historical beginning of the coalition of forces in western civilization that were to finally flower in the Fascist domination of Europe in 1942, and these are the forces that will finally culminate in a defeat of annihilation in 1945. European Fascism has staged the last counter-revolution in over 700 years of European history. The Bourbons and the clericals, the nobles and the peasants have made their last great military effort to reestablish the Fascism of the Holy Roman Empire. For over 700 years the kings and nobles and later business and finance, always with the church at their back, have stood as the great preservers of the status quo. They have stood as the bulwark in European society against social change to maintain **their** law and **their** order, and to permit only that change which enhanced their economic, political and ecclesiastical power.

The Treaty of Westphalia in 1648 terminated the bloody religious battles of the Thirty Years War. The Treaty of Westphalia was in actuality only an armistice between Rome and the forces of

reformation that represented social change at that time. Hitler as the leader of German Fascism continually screamed for the abrogation of the Treaty of Versailles and the Treaty of Westphalia, thereby fervently proclaiming the historical connection that we have delineated here. The Bolshevik Revolution of 1917 introduced social change of a new order.

The forces of reaction and counter-revolution immediately got under way on the international scene to suppress and overthrow this revolutionary upstart among the nations, this new harbinger of social change. Russia was invaded without a declaration of war by the armies of Britain, United States, France, Italy and Japan, her former allies in World War I, and by German armies, her former enemies in World War I. Russia was isolated in Europe by the erection of a Cordon Sanitaire around her western boundaries. The Cordon Sanitaire were the puppet states of Finland, Esthonia, Latvia, Lithuania, Poland and the territorial subtractions accruing to Romania and Turkey. It must be borne in mind that the Cordon Sanitaire was thought up by the

Bourbons and nobility of big business and finance of western Europe with the spiritual benedictions and support of the Vatican. Fascism first emerged as a political action in the Catholic countries of Italy, Rhineland and Bavaria. It is interesting to note that the Roman Catholic hierarchy under the command of the Vatican began preaching a holy crusade against Bolshevism. Fascism in Europe became the political action first, and later the military action of this holy crusade.

Fascism achieved political control in Italy in October 1922. In 1923 Hitler's National Socialist Party, the Fascist party of Germany, went down to temporary defeat in the Beer Hall Putsch of Munich of that year. Fascism did not gain control in Germany until early 1933 when Von Papen maneuvered a senile and dying Hindenburg into appointing Adolph Hitler Chancellor of the Reich. From then on the development of Fascism accelerated. In 1935, Poland adopted a constitution that would permit the creation of a Fascist state. This was shortly followed by civil war in Spain under the leadership of Francisco Franco and the

Falange, or the Spanish Fascist party. Spanish Fascism led by Francisco Franco and supported by the armed forces of Italy and Germany, which were helped out by the financial and material support of the financial Bourbons of France, Great Britain and the United States, extinguished the Republic of liberal Spain in 1937. Loyalist Spain, the duly elected Government of the Spanish people with over \$700 million in gold in its treasury, was unable to buy arms or military supplies with which to defend itself. Of all the nations only Russia came to the aid of Loyalist Spain. United States, acting contrary to international law, in 1936 placed an embargo on the sale of arms and military supplies to the Government of the Spanish Republic and yet at the same time it permitted some of the largest corporations in the United States oil industry to become the chief suppliers of fuel to Franco's Fascists. One of our largest automotive corporations, through its subsidiary export corporation, became the chief supplier of thousands of trucks and automotive vehicles to Franco's army while our State Department refused to grant an export license for the shipment of



a Chevrolet sedan from United States to Barcelona, Spain (Loyalist), for the stated reason that one lonely Chevrolet sedan landed in Barcelona could by stretching the imagination be converted into a war vehicle.

It is interesting to note that United States had a Presidential election in November 1936. It is also interesting to note that Papal Secretary Pacelli visited this country and the White House months before the National Election and approximately at the same time that President Roosevelt declared an embargo on the sale of arms to Spain. It is again interesting to note that President Roosevelt and the Democratic Party were returned to power in November 1936 with the greatest majority vote in the history of American politics. Franco's Spain became firmly established as an ally of all the reactionaries of the world of international finance, an ally of international corporate business and the religious internationalism of the Vatican, and a signatory to the Anti-Comintern Axis Pact of Fascism. In 1937 Japan, after completing its occupation of Manchuria, attacked China. The annexation of Austria and the ab-

sorption of Czechoslovakia were but incidents in the same world pattern of Fascism.

From 1934 to 1941 international business promoted, sold, shipped and delivered a continuous stream of scrap steel, oil, rubber, copper, nickel, lead, zinc, asbestos, cotton, copra, antimony, and arsenic to the ports of Japan, Spain, Italy and Germany. During this period many of the great leaders of corporate enterprise waxed fat from the profits of underwriting and supplying the materials for the creation of the Fascist war machines of Europe and Asia. Fascism in Europe and Asia was created as a worldwide conspiracy by the international clerical hierarchy. It was highly profitable business, this international game of supplying the sinews of war for the Fascist armies of Europe and Asia. It has been even more profitable business to produce the sinews of war of United States, Canada and Great Britain and Lend-Lease for the defeat of the Fascist armies.

Great Britain and her ally, France, declared war on Germany on September 3, 1939 when Fascist Germany invaded Fascist Poland. France in 1939 was the hollow shell of a nation rotten to

the core with Fascist intrigue. The Cagoulard, the Croix de Feu, the 200 families of France, the Roman Catholic hierarchy, the French general staff and the officer class, French business, big and little, were all alike militant pro-Fascist. One of the great lies perpetrated by the Fascist press and widely accepted in Canada and United States was that French labor and French radicals were responsible for the collapse and downfall of France. Marshal Petain, Pierre Laval, Diplomat Peyrouton, Administrator Boisson, Pucheu, and Cardinal Suhard are but a few of the more prominent of the millions of the French nation who were active Fascists and collaborators. General Charles de Gaulle heads the Provisional Government of France. The De Gaulle leadership, while it has constituted a rallying point for military action of the French people, sponsored originally by Churchill and his Tory conservatives and belatedly by Washington, has yet to prove that it will not revert to the Fascism latent in De Gaulle's social background. De Gaulle was a staff officer under Marshal Petain in the last war and later served under General

Weygand in Poland as part of the French military assistance to the Poles in turning back the Bolshevik hordes in 1920. General Charles de Gaulle comes out of a social background in France whose members have constituted the bulk of the leadership of French Fascism until June 6, 1944. Only the future will portray the true picture but it is safe to say that, if the new France is able to stage a revolutionary renaissance and a complete divorcement from her previous Fascist collaboration, it will be in spite of the leadership of De Gaulle and not because of it. It will be because new forces will have been generated within the French nation, within the people themselves, that will compel De Gaulle and his clique in the Provisional Government of France to bow to the inevitable or suffer political liquidation.

Belgian royalty and Belgium's best families sold out Belgium to Fascism as slickly as did their brethren in France. One must never forget that when General Korab, commander of 250,000 veteran soldiers (not conscripts) of the 9th Corps of the French Army, surrendered without a fight to the Germans at the Sedan



Gap, the end of the Maginot Line, the fall of France became inevitable. So too, when King Leopold and the Belgian Army surrendered to the Germans a little later, the debacle of Dunkirk became inevitable.

Clerical Fascism had permeated and ideologically conquered the national structures of Italy, Germany, Austria, Hungary, Czechoslovakia, Poland, France, Spain, Portugal, Belgium and Ireland before the spring of 1939. It had seduced and corrupted the ruling structures of Romania, Bulgaria, Greece, Yugoslavia and Finland at the same time. Simultaneously with this achievement it had succeeded in winning public favor and approbation and open-voiced support from Tory conservatives and better business in Great Britain, Canada and the United States. It had also succeeded in firmly implanting its doctrines and ideological leadership in the countries throughout the Latin world, through its paid export and subsidizing by its agents of business and finance and the trained emissaries of the Espana Falange. The Falange permeated the Philippines and every Latin-American country from the Rio Grande to

the Tierra del Fuego. In the history of the struggles and conflicts of the nations of the world, Fascism will have achieved the greatest ignominy of all time in that it has permeated more nations with treason, sabotage, mass murder and the sadistic torture of millions, all for the one purpose of creating a militant holy crusade for the suppression and destruction of social change.

Within the next few days the last organized military effort of European Fascism will be blotted out by the military might of the Allies. The San Francisco Conference will be staged at the Golden Gate on April 25 with all the tinsel trappings of international Hollywood ballyhoo. It will be extolled as the great meeting of nations coming together to found an organization which will enforce peace and security for all the nations of the world forever and forever, Amen!

The United States State Department, in collaboration with 10 Downing Street, London, with Paris and Rome, has succeeded in applying such a volume of the whitewash of international absolution to the black Fascists of Argentina that they have now grown the appropriate halos of good

neighbors and the golden wings of democracy, just in time to spread those wings at the San Francisco Conference, provided of course that Russia doesn't object. When all the fighting in Europe is for all practical purposes done for, all one has to do to be admitted to the United Nations is to technically declare war on paper against Germany and Japan. Last minute efforts are being made to have Italy declared a co-belligerent. No doubt Italy will declare war on Japan and this would entitle the birthplace of Fascism to be an honored member with full voting rights at the Golden Gate. Spain and Portugal, it is not too late, for even in the last hour you will be able to enter our Father's house, if you too cleanse your souls! Of course it logically follows that, if Japan were to declare war on Germany and Germany were to declare war on Japan, it would constitute **prima facie** evidence of their good intentions and therefore they too could add their voices to the hal-lujahs.

What a conglomeration! Never has there been such a collection of international vultures. Let us list the nations represented at the San Francisco Conference and

emphasize the black vultures of the peace in **bold face**:

Australia  
**Belgium**  
**Bolivia**  
**Brazil**  
Canada  
**Chile**  
China  
**Colombia**  
**Costa Rica**  
**Cuba**  
Czechoslovakia  
**Dominican Republic**  
**Ecuador**  
Egypt  
**El Salvador**  
Ethiopia  
**France**  
Greece  
**Guatemala**  
**Haiti**  
**Honduras**  
India  
Iran  
Iraq  
Lebanon  
Liberia  
**Luxembourg**  
**Mexico**  
Netherlands  
New Zealand  
**Nicaragua**  
Norway  
**Panama**



**Paraguay**  
**Peru**  
**Philippines Commonwealth**  
 Saudi Arabia  
 Syria  
 Turkey  
 Union of South Africa  
 Union of Soviet Socialist  
     Republics  
 United Kingdom  
 United States  
**Uruguay**  
**Venezuela**  
 Yugoslavia

The Big Four, Great Britain, United States, China and Russia, constitute the sponsoring nations for the San Francisco Conference. Leaving aside the 'Johnny come lately', Argentina, there will be nineteen nations from Latin America attending the conference. Great Britain, France, Canada, Belgium, Netherlands, and United States have welcomed Argentina back into the official family of nations by extending diplomatic recognition which had been withdrawn for some time. Argentina has therefore technically complied with all of the requirements for attending the conference at San Francisco. This would make Nation No. 20 from Latin America. Mayor LaGuar-

dia of New York and Representative Mercantonio have petitioned Washington to have Italy declared a co-belligerent and attend at San Francisco. Even Spain has broken off relations with Japan, but, leaving Italy, Spain, and Portugal out of the conference guests for the moment, we will pass on and include France, Belgium, Luxembourg, and the Philippines which, added to our previous twenty, brings the total to 24. These 24 nations are Roman Catholic in religion and have been satellite nations in the international orbit of Vatican policy. Of these 24 nations only three have been invaded by the enemy, Belgium, France and the Philippines. Fascist infiltration was the chief cause of the downfall of Belgium and France, and a contributing one in the Philippines. Only one other of these countries, Brazil, has indulged in an active military participation in this war and then with only a token contingent of Brazilian troops on the Italian front.

Great Britain, Canada, Australia, South Africa, India, and New Zealand comprise the six votes of the British Commonwealth bloc. The Russian bloc includes Czechoslovakia and

Yugoslavia. The United States, China, Norway, Netherlands, Greece and Ethiopia are all that are left of the attending nations, exclusive of the Mohammedan group. What a kettle of fish!

Great Britain, United States and Russia will be the three great military powers of the world upon the downfall of Germany and Japan. If the three all powerful conquering lions of the world cannot maintain peace and security, then forty jackals that rush in at the kill to devour the carcass will not be able to create world peace and security.

World War II is a total war militarily and ideologically waged by one set of nations supporting one policy against another set of nations supporting another policy. This war is a world conflict between two opposing policies. There have been and there are only two policies, Rome and Moscow, and all participants are allies of one or the other. How can you expect anything but an international double cross to come of San Francisco when the majority of nations invited are allies of the policy of Rome?

The United Nations conference in San Francisco has been called for the avowed purpose of having

the representatives, delegates and advisers of the United Nations assembled to confer, discuss, and decide upon the design and construction of a permanent international organization for securing permanent peace. The United Nations conference at San Francisco is not a peace conference. It will not lay down and determine the conditions of peace of World War II. It will not fix boundaries and allocate territories neither will it determine any war reparations. It will however erect on paper an international assembly of sovereign nations to be governed in theory by the common consensus of the majority; in actuality, to be controlled only by the coordinated agreement of the Big Three. To put it mildly, if the Big Three cannot agree among themselves, all of the lesser powers combined could neither prevent disagreement nor compel agreement.

The apparent purpose of the United Nations conference may be described as a laudable ideal internationalism but, in spite of this idealism, there lurks the deep suspicion supported by incontestable evidence that the underlying purpose of the San Francisco Conference is a smooth and wel



laid conspiracy of the Fascist majority of the United Nations to mobilize world opinion against Soviet Russia so as to counteract the defeat of Fascist Europe and Asia. This conspiracy is predicated upon the fundamental assumption that its success is dependent upon perpetrating a state of war between this country and Soviet

Russia. The machinations of the Fascist intriguers within the ranks of two of the Big Three have already created a dangerous crisis in the relationship between United States and Soviet Russia. If these machinations are permitted to continue, an open breach is inevitable in the near future.

—CHQ, Technocracy Inc.

*EDITOR'S NOTE: This article was released by Continental Headquarters of Technocracy Inc. on April 8. Since then the San Francisco Conference has followed closely the predictions made on that date.*

## The San Francisco Conference

**I**T IS TIME the American people became aware of what is really going on in San Francisco. On the public plane a charter is being written for a stable peace. But in private too many members of the American delegation conceive this as a conference for the organization of an anti-Soviet bloc under our leadership. And it is no exaggeration to say that not a few of them are reckless enough to think and talk in terms of a third world war—this time against the Soviet Union. That this is the basic pattern of the United Nations Conference is the conviction not of myself alone but of many astute American and foreign correspondents here and of progressive members of the American delegation and its entourage. If this is kept in mind, it will be easier to understand the Argentine and Polish issues, and to be forewarned and forearmed against a rightist turn in American Far Eastern policy and a softer attitude toward the future of the Reich. If this dual aspect of the San Francisco Conference is brought forcibly to public attention, it may yet be possible to stem dangerous undercurrents which have the gravest potentialities for the future.

—I. F. Stone in *The Nation*

# 'There'll Always Be an England'

*The United Kingdom is fast retrogressing from its position as the possessor of easily available energy to its next most probable energy state as two islands off the coast of the European continent. A valiant race, fighting a losing battle, is displaying an admirable fortitude in the crisis that is resulting from excess population, declining resources, and obsolescent equipment operated by the antiquated methods of a Price System.*

—HOWARD SCOTT (1932)

**I**N World War I it was the prevailing practice to divide the nations of the world into the simple classifications of major and minor powers. A major power was generally agreed to be a national entity that could in the time of war mobilize an armed force of one or more millions as a land army in conjunction with a certain degree of naval power and sufficient agricultural and industrial production and transportation facilities to supply and maintain its armed forces in any military conflict in which it might become engaged.

In 1914 Great Britain, France, Germany, Austria-Hungary, Italy, Russia, Japan and United States constituted the major powers of the world. In 1920 Austria-Hungary had disappeared from the ranks of the major powers. Germany, although defeated in 1918, had retreated with its banners flying, its general staff, offi-

cers and cadre units intact and, while technically disarmed by the Treaty of Versailles, it was nevertheless in the matter of trained personnel, population, agricultural production and industrial potential classified as a major power. Russia, although torn by invasion, defeat, civil war, revolution and famine, was still too in the category of a major power.

The end of World War I found most of the major powers, victor and vanquished alike, equipped with a greater industrial capacity and potential than when they entered the war in 1914.

Now, 27 years later, as World War II draws to its close in Europe, let us survey the scene. How many powers will remain in the category of the major classification when the conflict ceases? At the end of World War I, Great Britain, France, and Italy, the victorious powers, possessed large and well trained vet-



eran land armies and naval forces. Even vanquished Germany in defeat still possessed a competent and formidable military force in her land army. Today, in 1945, will the situation at the close of the conflict bear any relationship to that of 1918? Where is the 'Grand Army' of France, the great military force of Italy, the mighty BEF, and the millions of defeated Germans?

France, defeated and overrun in 1940, had never recuperated from a military standpoint in its population growth from its terrific losses of manpower in World War I. France lost over 2,000,000 of her armed forces as prisoners of war. These prisoners of war have been incarcerated in Germany in concentration camps or at slave labor. Besides the prisoners of war, some 700,000 additional numbers of French manhood were drafted as slave labor into German work battalions. Five years as a prisoner of war or as a slave laborer suffering from overwork and malnutrition in a foreign country has depleted the normal birthrate of France and it is obvious that the death rate of these 2,700,000 Frenchman would be greater than that existing in peacetime condi-

tions in their native France. It is therefore obvious that the effective military potential of post-war France is further reduced below that of 1939. It is well to remember here that, when we speak of the military power of postwar France, we are speaking of the probabilities of creating an armed force from the manhood of France. This does not include the black Senegalese of French Africa, the yellow Tonkinese of French Indo-China, or the possible colonial conscripts of French Algeria and Morocco. France at the end of World War II will be a long way from having sufficient military power to be classified in the major category.

The armies of Italy have melted away on the plains of Russia, the Balkans, Albania and Africa. Defeated Italy will no longer have an armed force of sufficient importance to be classified as a military power.

The great armies of Fascist Germany are in Russian prison camps or lie buried in Russian soil and the lesser remainder that have been captured by the armies of Great Britain, France and United States. Germany in 1945 will have no fighting army as it did in 1918. Its entire mili-

tary force will have disappeared.

**Only Britain and Soviet Russia of the European major powers will remain with armies of any size and in the classification of major powers. The Army of Soviet Russia will exceed by several times the entire remainder of military armed might in Europe.**

Great Britain, like France, was never able to recover her military losses of manpower in World War I. The total casualties of World War II will further impair the military position of Great Britain. The question which comes to the fore and which the Continent of North America and the world must face can be simply put: Will Great Britain be a major military power in the Europe of tomorrow? Great Britain with 47 million population has the high density of population of 495 per square mile. Can we expect Great Britain to increase its population much beyond its present total? Such expectations could only be realized provided the British Isles possessed energy, mineral, and agricultural resources great enough not only adequately to maintain its existing population but to provide for expansion of the future. Prewar

Great Britain was able to produce only 40% of the foodstuffs that it consumed.

Prewar Great Britain in its most productive years was able to produce between 240 and 260 million tons of coal annually. Great Britain under the emergency powers of war, the conscription of labor for coal mining, and the help of huge open pit mining machinery imported from United States, was able to produce only 193 million tons of coal in 1943. British coal production has declined 9 million tons annually since the start of the war in 1939. Britain, that once was the great source of tin for the Mediterranean civilization, no longer is a producer. British copper production has long since ceased. British iron ore has been in continuous decline. Great Britain during the war has been mining iron ore with an Fe content of 23 to 27%. With such an iron content per ton it would require five or more tons of iron ore and a like amount of coal to produce a ton of steel.

**The imperialist expansion of British mercantilism was based on the adequate resources, and their availability, of high grade steam and coking coal and rich**



iron ore. The tin is gone, the copper is gone, and the coal mines are going deeper and deeper and farther out and under the sea. The iron mines are going deeper, and the ore is becoming poorer. Do not misunderstand us, there will always be coal and iron and other ores in Great Britain but those ores will lie in sweet repose below the 7,000 foot level, the depth at which the law of diminishing returns becomes the arbiter of a nation's destiny.

Oil has been discovered and brought into considerable production in Britain but the future of British oil production can in nowise be viewed as rescuing the fuel resource situation of the British Isles because the oil surveys show that the oil fields mapped, both actual and potential, by drilling and geophysical surveys, are of a minor order of productive capacity when viewed in the terms of world oil.

Britain does not produce cotton. British wool production is insufficient to meet its internal needs. British production of lumber is totally inadequate to meet the requirements of British consumption. Britain can produce pulp only from imported material. Oil, fats, foods, miner-

als and other materials must be imported into the British Isles. Can Great Britain hope to compete in the international markets of the world with the ever increasing costs of her declining resources even in the manufacturing and fabricating from imported raw materials?

Prewar Great Britain averaged £866 million in imports annually and her exports, visible and invisible, amounted to £826 million; a net loss of £40 million of imports over exports. Great Britain has for a number of years been meeting this annual deficit in export-import balance by the deinvestment of her capital holdings abroad. Included in the £826 billion annual average prewar exports of Britain is £478 million of physical goods, but the figure of £478 million includes £90 million of imported foreign material, so the actual net physical export of Great Britain in prewar average actually is approximately £390 million.

Keeping these figures of British exports and imports from the Institute of Statistics at Oxford in mind, let us proceed. During this war Great Britain has been compelled to sacrifice practically all of its investments abroad in

order to meet its war purchases and to keep exchange balances. Great Britain, apart from Lend-Lease and the Mutual Aid program of Canada, has gone into debt on a huge scale in the world of international balances. It is reported that Canada has in its possession within the Dominion 2 billion American dollars worth of British currency at current exchange rates. Great Britain owes the nations in the bloc currency group approximately four billion pounds. Canada is not a member of the bloc currency group.

It is therefore obvious, according to the previously stated figures of British net exports of £390 million a year, that Great Britain is already in hock for her total exports for ten years. Lend-Lease and Mutual Aid are not even included in the above statement. Great Britain, in order to pay off her obligations to the bloc currency group alone and to maintain her previous prewar export status, would have to increase her postwar exports of net physical goods to over £800 million. Has Great Britain the resources and the facilities to double and more than double her production of physical goods for export, and at the same time sup-

ply the requirements for internal consumption plus national rehabilitation? The picture does not provide an affirmative answer.

In the face of the facts of the internal situation of the British Isles, Beveridge Plans, Government plans for housing, British cooperatives, Conservative and Labor legislation alike are but gestures of futility. Technocracy would like to recall here that its analysis of British conditions written in 1932 is being carried forward to its inexorable conclusion by the march of events.

The 120,870 square miles of the two islands known as Great Britain and Ireland off the coast of Europe have been the homeland and the focal area from which radiated the naval military endeavors, explorations, and mercantile imperialism which have expanded into the British Empire around the world. In over four hundred years of mercantile imperialism, the British Isles have been dependent upon the energy and mineral resources of their homeland to provide the means whereby Britain could become the great manufacturer, the leader of world trade, the great importer of raw materials from around the world, and the great



exporter to the markets of the world.

The transition from an insular island kingdom off the coast of Europe to that of the British Empire dominating the markets and trade routes of the world has been dependent upon the consumption of British energy and mineral resources in ever-increasing volume. The British Isles had passed their zenith in the consumption of fundamental industrial resources even before World War I. The resource position of the British Isles has been in continuous decline for the last half century and this position is becoming more and more critical as the years go by. Britain faces a resource position of even more drastic decline in the immediate future.

The nations of the other areas of the British Commonwealth of Nations overseas, which were once the dependent colonies of Great Britain and which for centuries were the great suppliers of raw material to the British homeland, have been transformed by area technology from dependents to superior producers and export competitors. Canada, Australia, South Africa and India have transformed themselves

from export agrarian economies to export manufacturing economies. These countries are far greater in area than the British homeland and are more magnificently endowed with energy, mineral and agricultural resources, and climatic range.

The policy of colonial expansion of mercantile imperialism can maintain the homeland position only if the colonies larger in area than the homeland are operated by human toil and hand tools as raw material suppliers at low labor costs to the heart of the Empire. When any nation takes over a colonial area greater in size and resources than its homeland and under the impetus of mercantile exploitation proceeds to develop that colonial area by the introduction of technological production in use at home, it will first export capital for investment in its colony. This investment of capital in colonial expansion will proceed for a number of years reaching a zenith and then falling away.

As the export capital is invested in the development and creation of capital goods industries in the colony, the homeland will prosper with greater export trade to the colony. The technological

production of the homeland will require that the colonial area must develop its conversion of energy per capita in order to consume the export product of the motherland. As the technological facilities of the colony are increased, its resources developed and its transportation coordinated, it automatically follows that the larger area of the colony will soon begin to approach and finally pass the mother country in its conversion of energy per capita per day. In the moment of its passing, if not before, the colony ceases to be a dependent of the mother country and becomes a more virile, more competent producer and exporter than the homeland.

Great Britain has arrived at this position in her physical relationship with her dominions overseas. The question every subject, or every citizen if you like, of the British dominions overseas should squarely face is how long can the British dominions overseas continue to provide the physical resource support for the operation of the British Isles. The British Isles, if socially reorganized under a technological control, can provide a high standard of living for 15 to 20 million

total population over an extended period. If the British Isles attempt to maintain their present population or to increase it, they face a future of decreasing standards of living, rising population pressure, and greater poverty which can be solved only by the export of Britain's surplus population overseas. It is with this in mind that Technocracy advocates that the Dominion of Canada grant immigration preference to 35 million British subjects.

No people in the world are entitled to more respect and admiration than the people of the British Isles have gained through their display of outstanding fortitude, courage and tenacity in the face of national adversity. Unfortunately, no nation however courageous can recoup its declining resource potential by the morale of its heroic citizens. Technocracy's analysis must not be interpreted as being in any way an expression of antipathy or opposition to the people of the British Isles. It is an analysis of physical factors presented to inform the people of this Continent, and as a matter of concern for the people of a nation who are our closest relatives in tradition, blood and language. —CHQ, Technocracy Inc.



# The Age of Alchemy

*This article is one of the finest to appear in any Price System publication during World War II. It backs up Technocracy's analysis of the economic situation that confronts North America and the World. Keep the preceding article in mind when reading it.*

**S**TATED simply, the one most important institution in our complex scheme of material civilization—universal in it—is breaking up before our eyes. World War I rocked it to its foundations; World War II may well finish it. The name of that institution is international trade.

People will always be free, we suppose, to exchange with one another unlike and unique goods, and may find endless satisfaction in doing it. What we speak of here is international trade regarded as a necessity.

In its origin there was no element of necessity, or hardly any, except in special regional cases. The spirit was adventure, the motive was profit, the method was one of ruthless exploitation of the innocents. The fact of necessity evolved, and as it evolved the profit declined, until profit alone—private profit—was not enough to sustain it; where-

upon governments began to take foreign trade out of the hands of private traders to control it for political ends and to subsidize it with public funds, because at last the necessity had become vital, and was of this kind:—

First, that a people who had abandoned agriculture for industry were obliged to import food and raw materials in exchange for manufactured goods, in order to live.

Second, that as the machines of the industrial nations multiplied, the output of manufactured goods came to be more than could be absorbed by the people who produced only food and raw materials and had generally a low standard of living. Then came the specter of surplus and unemployment in the industrial nations and the struggle among them to sell their similar and competitive machine wares in one another's markets. At the same time, each put up tariff barriers against the others; that is to say, each was

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trying to invade the markets of the others while desperately defending its own.

At the beginning of the modern machine age, Adam Smith, writing on the uses of foreign trade, said: 'The land and labor of Great Britain produce generally more corn, woollens, and hardware than the demand of the home market requires. The surplus part of them, therefore, must be sent abroad and exchanged for something for which there is a demand at home. It is only by means of such exportation that this surplus can acquire a value sufficient to compensate the labor and expense of producing it.'

This was about 1776. If we have the faintest idea of what the standard of common living was at that time in England, we know that there was no surplus of human satisfactions. The same labor, land, and capital that produced what Smith calls a surplus might have been employed to produce more of the goods people wanted at home instead of goods they had to send away. At least, that was true then. We know also that the goods they sent away did not all come back in the form of things the people wanted; a great part of what was

exported took the form of investments in foreign countries—tramways, railroads, docks, London facades in Shanghai and Hong Kong.

The kind of trade Adam Smith was talking about was trade for profit, and the profit was so great that England sacrificed her own agriculture to industry. In a little while there was no surplus corn to sell (corn in the Old World meaning small grains, not maize). Instead, she found herself importing not only the materials of food for human consumption but the raw materials her machines devoured. In a little while more her 'umbilical cords' ran to every part of the world; and since these cords were vital to her preferred way of existence she had to protect them. In order to protect them she had to control the seas.

The system worked very well and was wonderfully profitable so long as she had what amounted to a world monopoly of machine craft. The first nation to threaten that monopoly was Germany. The second was the United States. At the outbreak of World War I, these were the three principal industrial nations of the world; Japan was coming.

One effect of the war was that



the machine went migrating. Every intelligent nation wanted machines of its own, because, in the first place, it was seen that a nation with no industrial power of its own was helpless in time of war, even as a neutral; and, secondly, there was no longer any doubt that a people who produced only food and raw materials for export, and exchanged them for manufactured goods, tended to become fixed in the inferior economic status, with a low standard of living. Thus, new machine industry became apparitional all over the world; and no sooner had a country found its own way with machines than it began to want markets for a surplus of competitive machine products and a favorable balance of trade.

At a luncheon in London, Lord Astor turned to me, saying: 'Do you know, as a result of the war many countries now have industries that are not entitled to have them.' My answer was to ask: 'How does an Englishman determine what countries are entitled to have industry?'

Besides the countries that now had industries of their own for the first time, the three principal industrial countries had enormously increased their capacity

during the war, especially Germany and the United States; and meanwhile, Japan had arrived.

Such were the conditions under which Great Britain argued that even if she could afford to pay her war debt to the United States Treasury, we could not afford to receive payment. Why was that? Because she would have to pay us in competitive industrial products—in textiles, machinery, and hardware; and if we took such goods from her, what should we do with the American labor that was employed in producing like goods—not only enough for the American market, but a surplus for sale in foreign markets? If she should sell her goods elsewhere in the world to get the money to pay her debt to the United States Treasury, it would come to the same thing, for she would be taking away our customers.

What we did was to raise our tariffs against all foreign manufacturers, those of England included, to keep them from displacing American goods in the American market; and then we loaned Europe eight or ten billions with which to buy the surplus product of American industry. All of those billions we lost.

Worse still, a very large part of what we loaned to Europe and lost there in the 1920's was used to increase the industrial capacity of Europe, both in countries that had industry before, like Germany, and in others like Poland and Czechoslovakia. We were buying competition for ourselves.

And yet, because the political and financial ruin of international trade was an event the world was not prepared to face, all this immense absurdity was passed over.

The idea of economic self-containment now runs in bad company. It is associated with political isolationism. But we are not discussing self-containment as an idea or an ideal. We are trying to look at what has happened to international trade, and at the impending ruin of it; and if this does at length force the world into several great regions of self-containment, the people inhabiting those regions need be no more isolated from one another than farmers who lived side by side on the kind of farm plot that once was natural and ideal, beginning at the stream and running to the top of the next hill. Each farmer had, therefore, water, pasture, lowland, up-

land, and on the hillside his woodland. But he was not, by reason of this perfect self-containment, isolated from his neighbors.

With the profit gone out of it, and with the supply of docile people willing to perform the drudgeries of its primary production coming to an end, one would say that international trade had outlived itself; but one would say also that if the necessity for it were vital a way would be found to go on with it. Let it be a question of survival for the industrial people, of living or not living, and such a thing as profit really does not count.

But if the vital necessity is in a state of decline, tending to disappear, then the ruin of international trade as we have known it, and as we continue to think of it, is very clearly indicated. The startling premonition that this may be so has its strange occasions.

Not long before Pearl Harbor, reflecting on what might be the next state of the world and what we should do with a conquered Japan, I was turning the pages of the **Japan Times Weekly**, especially the advertising pages, for it was a number devoted to foreign trade, and there were the



things Japan was going to make and sell all over the world at competitive prices, save in Asia; she would enclose Asia from competition in order to sell them there on her own terms. What things? Well, all the things she once bought from the machine people of the West before she learned how to make them, first for herself and then for export. And these are the things, moreover, that the Western machine people still want to sell in the East: for example, machinery, tools, hardware, electrical equipment, glass, perfumes, pharmaceuticals, chemicals, motorcars, garage equipment, guns and munitions, typewriters, plastics, rayon, cotton goods, agricultural implements, surgical instruments, optical goods, engines of all kinds, tires and rubber goods, wire cable, leather belting, and so on and on. And for nearly all these things Japan has to think first of importing the raw materials.

In the same number of the magazine there was a continuing discussion of the Greater Asia Co-prosperity Plan. Under this plan the inferior people will be the hewers and drawers—and the 'inferior' people are all others than the Japanese. Thus, from China,

there will come to Japan coal and ore; and perhaps the culture of the silkworm, as seeming now to be below the dignity of an overlord people, will be transferred from Japan to China. From what was French Indo-China, rice, corn, and rubber will come to Japan. From Thailand, rice, rubber, lumber, and lac. From what were the Dutch East Indies, rubber, sugar, tea, tobacco, copra, and oil. From the Philippines, sugar, hemp, tobacco, and more lumber. Food for the Japanese and raw materials for their machines. Five or six hundred millions of Chinese, Javanese, Malays, and Balinese performing the tasks of primary production for ninety millions of Japanese; and for the Japanese, industry, banking, shipping, administration, profit, power, empire.

There is nothing new in this plan, save only that it is Japanese—that is, it is Japan doing to Asia what the West did to the East. Nor is there anything new in the naive Japanese words: 'In this way the relationship will become one of give-and-take, and will benefit both parties.'

But there was a Japanese editor, too, thinking his own thoughts, as an editor sometimes

will; and suddenly all this grand thesis collided with something the Japanese propaganda bureau had not put in his mind—namely, the premonition we spoke of. He did not intend this to happen. It was as an accident. He was writing an editorial about what would happen to Japan if the United States stopped buying her silk, and he said, defiantly: 'As the United States believes it is ready to do without much or most of its silk, by the substitution of nylon, this country also has to learn to do without some of the things which silk dollars could buy. Synthetic methods are not confined to one country.'

And from there he went headlong to the accident. 'The growing power of chemistry,' he said, 'is doing much to provide the have-not countries with the products they need, even as Germany has been able to make a synthetic rubber of great practical value, whose quality is improving monthly. No research or manufacturing chemist today would hesitate to predict that most countries, in a not too distant time, will be able to find all the essential things in their own back yards. There will be merely the necessity to pass soil and

rocks through machines or processes for the recovery of wanted materials. The outlook offers a distant solution to the problem of international trade. It should not be necessary for a country, in order to live, to send its manufactures to distant lands or to import the necessities.'

Now what had he said? If it were true, then neither the China affair, as they speak of it, nor the contemplated total conquest of Asia and the South Pacific which was about to begin, could be regarded as a rational adventure. There was pride of idea in what he had written; he believed it. Yet what would the censor say?

Therefore he added this: 'Japan in due time will have to find her opportunities within her own economy, but the situation today demands interim measures such as the government is working out.'

Here is, perhaps, the strangest thing that was ever defined: an interim war; a war belonging not to the future but to the past; a war not to perpetuate international trade but only to keep it alive for a while.

This consternation of doubt, taking place in the mind of a Japanese editor, is merely a vivid



and unexpected exhibit. The economic thought of the world is in the same way stultified. When the war is over, shall we have to scrap our synthetic rubber industry, keeping only a few plants to remember it by in case we need it again? And if so, why? In order that we may go on buying natural rubber in Asia, for unless we do go on buying rubber in Asia, instead of making it for ourselves, it will be very bad for international trade and ruinous for the people of Asia who have learned to live by rubber—to say nothing of our friends, the Dutch and English, who own the rubber plantations.

We can now begin to make out dimly the economic evolution that is taking place. We are passing from the age of machine techniques to the age of alchemy. It is a momentous event. Future and past are in conflict. One remembers the saying of Walter Bagehot, on history, that many times it had seemed that people were about to make a great step forward, they had prepared for it, they knew what they were doing and where they were going; then they had looked back, and did not advance.

If one takes the Anglo-Ameri-

can projection to be authentically represented by the Atlantic Charter, the system of lend-lease agreements touching the world that shall come after, the Hull Doctrine, the apocalyptic economics of Henry Wallace, the guilt theme of Sumner Welles, the Report of the London Chamber of Commerce on the General Principles of a Post-War Economy, and what may be called the British Confession by Sir Stafford Cripps, one will see that it begins with contrition and proceeds from a certain assumption as to what was wrong with the world before. Those who mainly controlled the raw-material resources of the earth were too selfish, too much concerned with their own profit, too unmindful of the needs of others. That was wrong. That was why international trade became a moral and economic nightmare. Hereafter it must be different. Nations must learn to think not only of themselves but of one another, too; and all people must have access to raw materials and markets according to their needs.

All of this, says the other side, is Devil's holy water. The aggressor mentally assumes that those who control the sources of

raw material will be selfish and heedless. What is possession for? Sources of wealth are not to be shared. They are to be exploited by those who are strong enough to take them.

But what is left out—missing both from the Anglo-American projection and from the brutal aggressor thesis—is the fact of economic evolution.

As we pass from the age of techniques to the age of alchemy—if we do—we shall cease to think of raw materials as deposits of solar energy that must be dug out of the earth's crust, or as a kind of plant life that will flourish only in a certain place. The sources will be such as no one can conquer, possess exclusively, or exploit selfishly.

In forgotten textbooks, one finds that less than a hundred and fifty years ago the political and economic thought of the world was sunk in gloomy meditation on the food supply. A man named Malthus had written a treatise in which he demonstrated what was then a fact—namely, that population in a natural way tended to increase much faster than the food supply. The number of arable acres was a limited quantity, not by any means in-

creasable, whereas the impulse of the human species to reproduce itself knew no limit. If this were true, then the human race was doomed to be limited by a tragic fringe of misery and starvation, unless it could think of a way to limit itself by continence. The reason no one could reason away this doctrine of Malthus was that no one could imagine what was going to happen.

It was not that vast areas of virgin land were opening, as in North America; there would soon be an end to that and the situation would be again as it was, according to the Malthus formula. Primitive agriculture was passing; scientific agriculture was coming. Knowledge was increasing. The application of scientific thought to agriculture, plus modern transportation, so increased the power of man to bring forth food from the earth and to make it available that in the hundred years after Malthus population increased as it had never increased in any century before; and the more it increased, the more food there was, to the absurd point of surplus.

From this unpredictable solution of the food problem there was a tremendous release of



human energy. The measure of it may be imagined from the fact that in two generations the amount of human energy necessary to be spent in agriculture fell at least one half. That is what made the industrial age possible. Otherwise it could not have arrived. The labor for it could not have been spared from agriculture.

But with the rise of modern industry appeared a new kind of food problem. There was a new stomach to fill. Machines had to be fed. They devoured raw materials insatiably. And as it had been once supposed that the human food supply was limited by what the art of primitive agriculture could produce from an inexhaustible number of acres, so, when we began to worry about enough raw materials to feed the machines, it was supposed that the supply of these was limited, too. A coal mine here, an oil well there, a kind of tree that would flourish only in a certain climate—and whoever owned the coal mine and the oil well and the area where the tree grew could feed their own machines and starve the machines of rival people. So there came to be a Malthusian doctrine of raw ma-

terials, and it was implicit in the power politics of the world.

Like the original Malthusian doctrine, this one was true in the making—true, that is to say, in relation to the then state of knowledge. Today it is true mainly for the reason that we continue to think and behave as if it were, war being one form of that as if behavior. In a little while, if we advance, not only will it not be true: it will be remembered as a superstition. Already we know better. The disparity between what we know and what we do is the supreme tragedy.

Liberating knowledge—it is scientific knowledge we speak of—does not come as revelation. It grows by accretion. Its beginnings very often seem frivolous.

What happened to the ivory trade? Man wanted more and more ivory, especially for billiard balls, and the supply was failing. It would not pay to cultivate elephants for the tusks; besides, it was perhaps impossible ever to get enough that way. Where did ivory come from? Not from the elephant, really, but from what the elephant ate. What the elephant ate was grass. Therefore ivory was from grass. The elephant was merely a natural

chemical works, converting something that was in grass into a thing called ivory. Even then one might have been sure that when the demand for more ivory, or for something that would do in place of it, became very urgent, so that the incentive was high, a brooding chemist would begin to think like that and end by finding what that something was, in the grass the elephant ate, that made ivory. At any rate, that happened. He found it. And then it was possible to do purposefully in an artificial laboratory what the elephant does naturally without knowing how. After that there were plenty of cheap billiard balls.

Such, very roughly, was the beginning of plastics, and yet it is only now, under stress of necessity, that we perceive the possibilities of plastics in structural uses, in place of natural raw materials like iron and lumber. Now we begin to see plastic automobiles, plastic airplanes, plastic houses, even to imagine plastic cities and to speak of the plastics age, as once we spoke of the iron age and then of the steel age. And the source of this amazing, versatile material is as free and as wide as air and sunshine.

For many years one of the great driving gears of the international trade machine was named textiles. The people who had invented and perfected textile-making machinery, especially at first the British, imported the raw fibrous materials, such as cotton and wool, made them into cloth, and exported the cloth to all parts of the world. Among the principal buyers were those who produced only the natural fibers and made no cloth for themselves. Anyone looking at this situation might have believed it was permanent. It represented a division of labor between peoples—those who had the suitable areas and climate to produce the fibers and those who had the textile machines to make the cloth. One result was that the common kinds of cloth were very cheap. And how else but by this division of labor and this exchange could the world be well and cheaply clothed?

Then the meddling chemists, with nothing better to do, and only to see if they could, found a way to make textiles without natural fibers—that is, without wool, flax, cotton, or silk. They could make it out of a chemical mess that lay at the cellular base



of all plant life; and as they went on, they found they could make it out of coal and air and water, or out of sand. But they needed a machine, too; and impish mechanics obliged them by inventing a machine that is in fact an immense silkworm, to spin their sticky stuff into threads.

For a generation we have been staring, with a kind of stupid wonder, at the prodigious rise of the artificial textile industries, loath to accept the economic implications; so loath, in fact, that governments have subsidized with public funds—what? Not the artificial textile industries, but the culture of natural fibers, like cotton, because the producers were being damaged by the competition.

Until World War I, the first anxiety of any nation thinking of war was about nitrates. Without nitrates high explosives could not be made. The one natural source of this essential material in great quantities was a rainless Chilean desert on the western side of the Andes, where for many ages bird guano had been deposited until there was a bed of it two miles wide, two hundred miles long, and five feet deep. Before World War I, both Germany and Eng-

land accumulated great piles of this Chilean guano, but not enough. No sooner had they begun to shoot it at one another than they realized that they had greatly underestimated the amount of high explosives they were going to need. The German Navy tried to blockade the Chilean coast, to keep England from getting any more. The British Navy had the same thought at the same time, and won.

Yet all of this was time and energy wasted. When Germany was cut off from the Chilean nitrates, she remembered that her scientists knew a way of filching nitrogen out of the free air. They got from the air all the nitrates they needed for the duration of the war, and since then all nations have been getting their nitrates from the air.

Only two or three years ago it would have seemed that a plan of grand strategy for a mechanized war could be based on rubber alone. No nation without rubber could go far with mechanized warfare. Its system of motor transport would break down. Indeed, Japan's strategy was aimed at getting control of the rubber of Asia. Her success in cutting off both the United States and

Great Britain from their principal sources of supply might have been for us a major military disaster. But fortunately, we already knew how to make artificial rubber. We had never done it, but we had the formulas, the chemical knowledge, and the materials. What materials? Petroleum is one. Alcohol is another. Petroleum comes out of the ground, and we happen to have more of it than anyone else in the world. But alcohol comes from wheat or corn or potatoes or cane. We can plant and reap it, as much as we need, and so can anyone else. We are going to use both for making rubber; and if the war continues for a year more—that is to say, if the necessity continues—we who were the largest buyers and consumers of rubber from Asia need never buy another pound of it there.

In the same way, a plan of grand strategy might have been based on oil. That in fact was done many times. There was a world struggle for oil. Possession and control of its sources was the great aim of power politics. Before oil it was coal. For nearly a century Britain's superior coal measures were one of her four

aces in the game of foreign policy.

Why are coal and oil so important? Because they contain and can be made to release solar energy that was caught and turned cold in the crust of the earth millions of years ago. One is solid. The other is fluid. They are so much alike in chemical nature that both can be made to do the same work. Yet neither coal nor oil is a source of energy. They only store it. The source is sunshine.

What so suddenly invested petroleum with its supreme importance was the arrival of the internal combustion engine. Motor transport and aviation both rest upon it.

Imagine, then, that all the oil wells of the world go dry. There is no more petroleum. In that event, should we have to abandon the internal combustion engine? Should we lose the power of wings and fall out of the sky? Not at all. Two things would happen, both of them relatively simple. The engineers would redesign the engine, and for this redesigned engine the chemists would design the fuel.

You understand, of course what it means to say the engineers would redesign the engine



They might have to change the length of the piston stroke and the diameter of the cylinder and modify the carburetor, and so on. But do you understand so well what it means to say the chemist would design the fuel? Mark it. For upon that one point the age of alchemy revolves.

Hitherto man has acted on the outwardness of matter as he found it, not upon the inwardness of it. That is to say, he has accepted matter in its natural forms as nature left it, and has adapted his ends to the limitations of matter in those natural forms. Thus, petroleum as he found it was not the ideal fuel for the internal combustion engine; it was only the most abundant and the most available, and he adapted his engine to it.

Now, however, he acts upon the inwardness of matter, to change the form of it as he likes, so that, instead of adapting his ends to the means, he may adapt the means to his fantastic ends. He finds that matter in any one of its natural forms is what it is because its molecules have a certain internal atomic structure. That fact is no longer final. He can alter the fact.

He has never seen that internal

structure of the molecule. Nevertheless, he can draw a picture of it. Then he makes the astonishing discovery that he can change the picture. That is to say, he can redesign the molecule. He can break it down and build it up again to another design; and as he does this to the molecule, the form of matter he wants is bound to appear.

Is it rubber he wants? Suppose there is not enough of it in the natural form or he has been cut off from the source of it. But he knows that rubber is rubber only because its molecules have a certain internal design. All around him is other matter full of molecules that can be redesigned; and when to the molecules of this other matter he has imparted the rubber design, lo! there is the rubber itself.

Is it energy he wants—energy in liquid form that can be carried about in tanks, like petroleum? He may have no petroleum of his own or, again, not enough of it. He notes that sunshine still falls upon the earth as it did when solar energy was being stored in coal and oil. From there he goes to find that there is an annual catch and store of it in plant life. When he has made al-

cohol from the plant, he has solar energy again in liquid form. Thus he can reap it in the fields instead of digging it from the ground.

There is more. Hitherto, when man for his ingenious ends has wanted a material that was very hard or one that was very tough, he has had to find the hardest or toughest substance that occurred in the natural form and make it do; but now he says only that he wants something this is so hard or something that is so tough, and that it must be able to resist heat and cold to certain degrees, and the chemist undertakes to produce it artificially. When he has produced it he gives it a name, and it is a name strange to nature. Again he has redesigned the molecule, and this time to a pattern nature never thought of.

And now do we know what we mean when we speak of raw materials? Do we mean matter in certain natural forms, as na-

ture made them and where she accidentally put them? Or do we mean just matter, which is everywhere?

Man acting upon his environment to alter it and man acting upon matter to change its forms are as of two different species. Given now the carbohydrates, vegetable oils, the alcohols, sunshine, air, land, and water, it is possible for him to shape matter in whatever form he likes—or nearly so.

What vistas are these, to be widened and lengthened by the necessities of a war which, in so far as it represents a struggle for the sources of natural raw materials and for markets, may be already obsolete in time and meaning! If this time the human enigma does not blow himself off the earth, he may come to a future such as he has not dared to dream of, and, for all his folly, a future of his own making.

—Garet Garrett

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★ IN 1933 PRESIDENT ROOSEVELT commissioned George Peek, the nation's leading foreign trade expert, to prepare a report of America's foreign trade between the years 1896 and 1934, a period of 38 years. With the \$50,000 furnished Mr. Peek he began his survey and one year later submitted it to Roosevelt. No one ever heard anything about it as Peek concluded his report with this statement: 'Our foreign trade for the 38 years between 1896 and 1934 did not bring us a profit, but brought us instead a loss of \$22 billion.'

—CALIFORNIA MINING JOURNAL



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. *Encyclopedia Americana* says: Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Bunde Veblen (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that technocracy had been reborn suddenly, full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves into an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Technology's Decree

**T**ECHNOLOGY is the social mechanics of the Power Age. The aspirations of human society of the North American Continent must be but the projection of the technological pattern of this Continent. The wish-fulfillment of the masses, the sincerity of the reformer, the enterprise of the politician, the vision of our intellectuals, the pathology of our economists, are but gestures of futility, straws in the wind, in the face of the march of power.

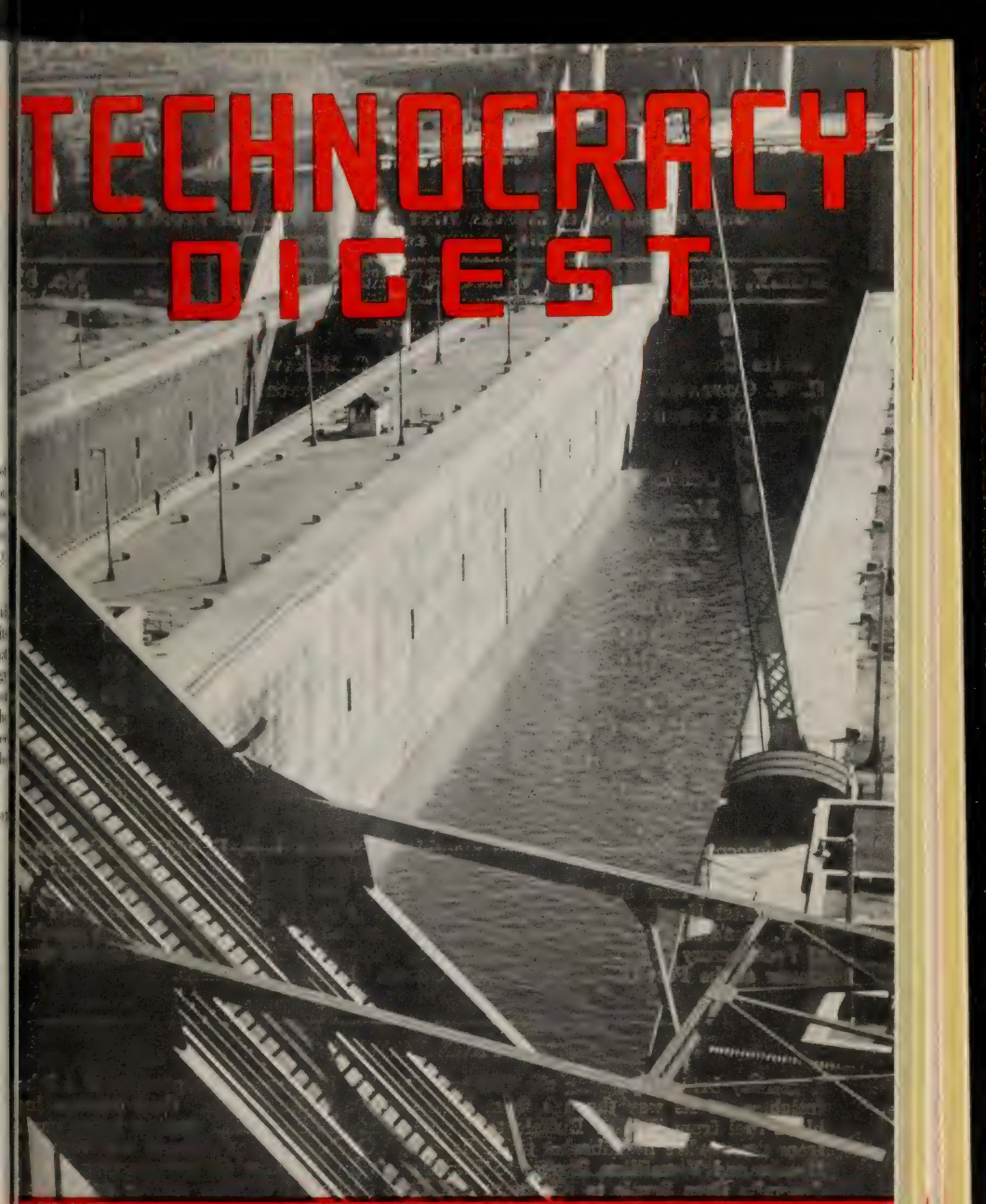
The soldier and the seer, the politician and the priest, the business man and the banker have ruled human society in every age until now. Technology in its march of power is serving notice on all of these, chiseler and sucker alike, that their day is passing, that a new order is clamoring at the gates. As technology moves up more power the gates will go down and a new leadership of men and things will be given to the world. This leadership will spring from those of the trained personnel of this Continent who have the courage, capacity, and discipline to administer and direct the technological application of physical science to the conduct of human affairs on this Continental area.

Today it is a notification. Tomorrow it is a command.

—HOWARD SCOTT

(Section Stamp)





# TECHNOCRACY DIGEST

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# TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS  
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## FRONT COVER

A railway bridge spanning the Welland Canal is lifted to allow passage of a lake freighter on its way through from Lake Ontario to Lake Erie. Coal carriers lug black fuel from Erie or Buffalo to Toronto and the Soo; bulk carriers bring grain from the world's breadbasket to Midland and Collingwood or rust-red ore from the Mesabe and Vermillion Ranges to Hamilton and Conneaut; oil tankers take liquid dynamite from Sarnia to Kingston, and little package freighters deliver paints and steel pipe and breakfast food from Montreal to Cornwall.

(NATIONAL FILM BOARD PHOTO)



# Science's Greatest Opportunity

*Technocracy, science in the social field, will achieve the most biologically significant event in human ecology, for it will have changed evolution from a haphazard selection through survival of the fittest to a planned progression for the arrival of the fittest.*

**T**WENTY-FIVE years ago in North America there was formed a group of scientists and engineers headed by Howard Scott and known as the Technical Alliance. These men made a survey of the natural resources, energy consumption, physical equipment, and social structure of this Continent.

From the mass of measurable facts thus acquired there emerged the inevitable pattern that human affairs in this area must follow if our Power Age civilization is to continue. It was evident that the increasing use of extraneous energy would bring North America face to face with the most fundamental social change in history. Today twenty-five years later, we approach the crisis, and its nearness is being felt.

To meet the crisis—to usher North Americans into a new era of abundance for all—is the task that the Technical Alliance (now Technocracy Inc.) has set as the

goal of twenty-five years of effort. No other organization on this Continent is prepared to meet that crisis.

Technocracy has the only blueprint that represents a coordination of measurable facts. No financial finagling or political phantasms will see North America through.

That crisis will offer only one chance—take it or leave it. If the citizens of this Continent follow Technocracy's blueprint, they will enter a greater civilization than the world has ever known.

Science has dared many things, but here at last is its greatest opportunity. Technocracy, science in the social field, will achieve the most biologically significant event in human ecology, for it will have changed evolution from a haphazard selection through survival of the fittest to a planned progression for the arrival of the fittest.

—The Editor

# Men and Molecules

*Do the scientists, technologists, and engineers of this Continent realize that the technological application of physical science to the means whereby people live has made government by science imperative and inevitable in this area?*

—HOWARD SCOTT

A W, for Pete's sake!' said John Jones.

He snapped shut his magazine with such violence that his traveling companion turned with a start from his peaceful contemplation of Canadian scenery flitting past the train window.

'Sorry,' Jones apologized, 'but I just can't help blowing off steam every time I read that nylon stockings are made from coal, water and air. Now I'm not saying it can't be done, mind you, but it's how it's done that puzzles me, and these articles never tell you anything about that.'

He turned his chair to face his companion.

'Maybe you haven't thought much about the problem, but with me it's different,' he went on, with an air of professional pride. 'You see, I've been in the coal business for 30 years and a lot of people look upon me as sort of an expert in my own line.'

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Reprinted from C-I-L OVAL.

You'd be surprised the fantastic notions this coal, water and air stuff gives them. Some of them think you make nylon by whipping up coal dust in water, as you would mayonnaise, or by melting the stuff like beeswax. Now, I can tell them they're away off the beam, but when they say 'all right, you tell us how it's done', I'm stumped. What's more, a lot of people can't understand why nylon stockings used to cost \$1.65 a pair before they went off the market a couple of years ago—air is free, water almost free and I sell the best coal for \$16.50 a ton.'

The tall man in gray tweeds grinned amusedly and fumbled in his pockets for his pipe and matches.

'You know, you've got something there,' he remarked, 'and I can certainly see what's bothering you. At the same time we chemists don't always find it easy to go into detail on these matters using simple everyday language.'



John Jones looked upon his companion with new interest. 'A chemist eh? I've always wanted to meet one of you fellows and find out how you perform your magic tricks—making plastics from sawdust, wood from cow's milk and peanuts, raincoats from limestone. Especially this business of making nylon stockings from coal, air and water. Sounds like sheer magic to me.'

'Things like nylon don't just happen.' The Chemist emphasized. 'It may surprise you to know that it took about ten years of intensive research and an expenditure of possibly ten million dollars before the commercial production of nylon was made possible. And even then it was necessary to erect huge, complicated and costly chemical plants before nylon could be put on the market in worthwhile volume.'

'Phew! Ten years and ten million dollars, and then all that plant on top of that,' Jones ejaculated. 'No wonder nylons used to cost \$1.65 a pair. But I'd certainly like to know how they are made from coal, water and air.'

'Well, there's a lot of chemistry between a hunk of coal and a hank of nylon,' said The Chemist, 'and it's hard to know just how

much to tell and where to begin.' He settled himself comfortably in his chair and lit his pipe.

'Look,' he went on. 'We have lots of time. Suppose we just ramble along for awhile. We chemists sometimes find it hard to understand what there is about our profession that mystifies the average person. So you ask the questions and I'll try to answer them.'

'Swell!' said John Jones. 'First of all maybe you can tell me in a few simple words what chemistry is all about. I do mean simple though—I didn't even touch the subject in high school.'

'That's a tall order, asking me to define chemistry right off the bat,' said The Chemist. He paused for a moment and gazed thoughtfully out of the window.

'Let me put it this way,' he began hesitantly. 'What we chemists do is study the composition of Nature's products. We try to find out how we may change them to suit our own purposes, and we observe how Nature works so that we may learn to create new substances which are better adapted to man's needs than any natural materials.'

'The study of Nature's ways,' he continued, 'may be said to fol-

low two paths, analysis and synthesis. Analysis means breaking down into parts or original elements. Synthesis, a comparatively modern achievement, means putting together, or building up.'

'Now I've got it,' said Jones, slapping his knee. 'I can see what synthetic really means. And I've always thought synthetic was just another word for a poor substitute for a natural product—artificial, so to speak.'

'A great many people make that mistake,' said The Chemist. 'The meaning of the word "synthetic" was distorted in much the same way as the word "artificial", which originally meant "made by a craftsman." It all arose from the popular fallacy that Nature's products are flawless and that man-made products are at best mere imitations. Actually, even when the chemist has imitated Nature, he has often been able to go much further and develop products that eliminate many of the faults in the natural prototype.'

'You are not trying to tell me that man has actually excelled Nature in creating things?' Jones asked incredulously.

'From man's point of view,' said The Chemist, 'certain man-made things are superior to anything

found in Nature. But remember, Nature's purposes are usually quite different from man's. Silk clothing was not intended as a gift of Nature to man. In some respects silk is inferior to nylon as a textile, but it is highly doubtful if you could convince the silkworm that nylon would suit his purposes as well as Nature's product.'

'That's very interesting,' said John Jones. 'But tell me more about the synthesis business. You said something about it being a modern achievement.'

'Modern in the sense that the chemical theories on which modern synthesis is based were developed during the 18th and 19th centuries,' The Chemist replied. Probably the most interesting of these theories is the idea that everything is composed of tiny particles. This idea was first suggested by the ancient Greeks, who called them atoms, which is the Greek word for indivisible. But it was not until the beginning of the 19th century that the theory of atoms was put forward in a scientific way.'

'Now, there's something I'd like you to explain to me,' Jones suggested. 'I've got a general idea what atoms are, but I'd like to



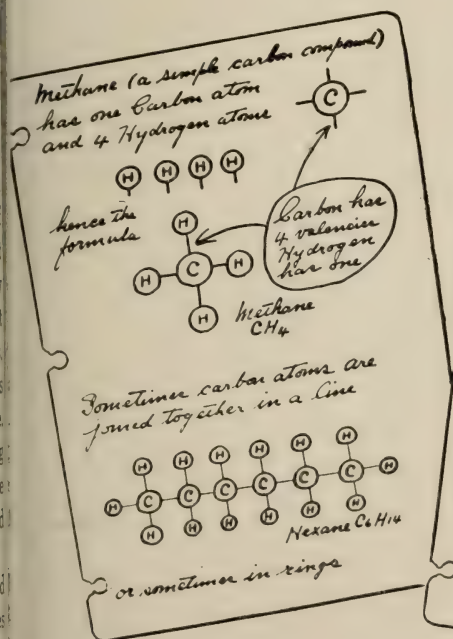
know how you chemists figure that everything is made up of such tiny things. What do they look like?’

‘It’s not very easy to describe an atom; no one has ever seen one, or is ever likely to,’ The Chemist said. ‘They are too small to examine even with the most powerful microscope. In fact it’s misleading to call them particles at all. They are more like planet-

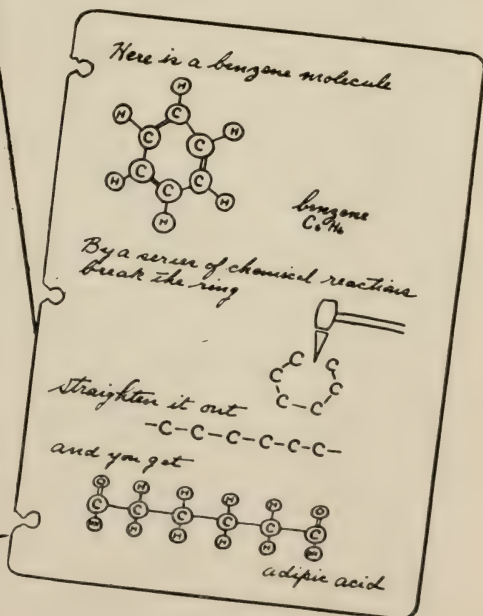
ary systems made up of even tinier particles whirling around in space.’

‘That makes it even harder to imagine how atoms can be built up into anything,’ said Jones. ‘What holds them together anyway?’

‘Atoms cling to one another by bonds called valencies,’ The Chemist explained. ‘The structural units built up in this way are



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Page Two

called molecules and molecules in turn can be joined together in various ways . . . '

'First atoms, which are mostly space, now valencies and molecules!' Jones interrupted. 'You're away over my head.'

The Chemist drew a notebook from his pocket. 'Don't let it worry you,' he said. 'The value of this sort of theorizing is that it enables us to represent chemical changes in terms of the interaction of atoms and molecules.' He sketched two simple formulae on a page of his notebook. (See **page one of Chemist's notebook illustrated**).

He went on to point out that chemists have so far been able to identify nearly 100 of the primary atoms, which they call elements. 'The commonest elements in living things are carbon, hydrogen, oxygen, nitrogen and sulphur.'

A slightly bewildered look still clouded Jones' countenance. 'I can follow you up to a point,' he said, 'but I'll be blown if I can understand how you can get from these chemical elements to common, everyday things—like the wood in that match you're holding, for instance.'

'All right, let's see what the

wood in this match is composed of,' The Chemist replied. 'When I burn it, in effect I will be breaking it up into its chemical components. Most of the match will disappear as carbon dioxide and water vapour, which are formed when the heat of the flame causes oxygen from the air to combine with carbon and hydrogen in the wood. The remaining ashes will contain essential mineral substances which the tree took out of the earth.

'You will probably be surprised to learn,' he continued after pausing to light up, 'that most of the tree from which we got this match came from the atmosphere in the first place and not from the earth. From the carbon atoms taken from the air's carbon dioxide, complex carbohydrates are formed in the leaves of trees with the aid of water and sunlight. Among these carbohydrates is cellulose which comprises the bulk of the tree's trunk, branches and leaves

'It may seem incredible, but from these simple substances carbon dioxide—the same gas that fizzes in your soda pop—water and minerals, Nature builds up our forests, grass, fruits and flowers, which in turn provide sustenance for all living things



on earth, be they animals, birds, insects, fishes, chemists or coal dealers.'

'I guess Nature's chemistry makes you fellows look like bikers in spite of your nylon,' said John Jones. 'But look here. With carbon being used up all the time by plants, isn't there danger of the supply running out?'

'Not at all,' answered The Chemist. 'The supply is constantly being replenished. Carbon dioxide is a compound of one carbon atom and two oxygen atoms. Plants use up the carbon and set the oxygen free. Animals in turn, breathe the oxygen of the air, combine it with carbon which they have taken into their bodies from vegetation, and breathe out carbon dioxide. Burning and rotting of plant and animal tissue also serve to restore carbon to the air.'

'That's an interesting cycle,' remarked Jones. 'Plants get their carbon from the air, and the air gets its carbon in a roundabout way from plants. Which came first in the beginning, the plants or the carbon dioxide?'

'You might as well ask which came first, the chicken or the egg,' laughed The Chemist.

He went on to explain that although most of the carbon taken from the air by plants is restored eventually to the atmosphere, some of it is sidetracked and stored up for millions of years in the form of coal, oil or natural gas.

'Gosh, that's true,' Jones commented. 'A few years ago I had a chance to go down in a coal mine in Alberta, and they showed me the imprint of a giant tropical fern embedded in a coal seam. They told me that fern just about tells the whole story of the vegetable origin of coal.'

'Fossils such as that could tell an even more dramatic story,' The Chemist said with a twinkle in his eye. 'Several millions of years ago, it is not unlikely that fern absorbed some of the carbon atoms exhaled by some nightmare prehistoric monster. It is rather amusing to think that modern organic chemistry can unlock the breath of our ugly friend, the dinosaur, after several millions of years of imprisonment in coal, and turn it into nylon stockings.'

'Whoa, now,' Jones broke in, and a long derisive toot of the train whistle echoed his words. 'Imagine me explaining to my customers that nylon is really

made from dinosaur's breath! But organic chemistry is a new one on me. How is it different from any other kind of chemistry?"

"To put it simply," explained The Chemist, "organic chemistry deals with the compounds built up around carbon. As I have already indicated, all plant and animal life is built up primarily of carbon. Inorganic chemistry, on the other hand, is concerned principally with materials derived from the minerals of the earth."

The Chemist went on to explain that not only plant and animal life, but also the compounds synthesized by organic chemists owed their existence to a remarkable property of the carbon atom. "As I have already indicated here," he added, pointing to the sketches in his notebook, "the carbon atom has the ability to combine with itself, as well as with other elements, and in this way extremely complex molecules are formed."

"You know, this stuff is really interesting to me," Jones said. "I've been in the coal business for 30 years, and this is the first time I've realized why coal is so important other than a mere fuel. From what you tell me, it is the carbon in coal that is the whole heart and soul of this business of

organic synthesis."

"Not just carbon," The Chemist hastened to explain, "but carbon which has already been built up by nature into complex compounds. By preserving intact the structure of these carbon compounds, we are saved the difficult first step in building up many synthetic products. When building a house it's nice to be able to buy prefabricated parts like walls, doors, windows and even bricks, instead of having to start by cutting your own wood and baking your own bricks."

He went on to explain that the arrangements or patterns formed by atoms and molecules determines the nature of the finished products.

"I see," said Jones. "Just as an architect can design totally different houses by different arrangements of the same building materials."

"Yes, but remember that the variety possible in chemistry's architecture makes it hard to imagine that there is any similarity in the basic materials," said The Chemist. "Ready made, built up carbon compounds such as benzene obtained from the black sticky stuff called coal tar, are the source of an amazing variety



of things—ingredients of military explosives, dyestuffs, drugs, perfumes, and a host of other products including our relative newcomer, nylon.'

'Now we're getting somewhere,' said Jones eagerly. 'Let's see if I understand what you're driving at. You said that carbon compounds are the materials chemists use to make their synthetics. Now you say that nylon and a lot of other things are made from benzene, which you get from coal. How does all this add up to nylon stockings?'

'It's all because the benzene molecule, besides being a readily obtainable carbon compound, was discovered to have the very structural characteristics that were needed for synthesizing nylon,' said The Chemist. 'Let me tell you how it all came about.'

He paused to refill his pipe and rubbed the bowl reflectively along the side of his nose.

'Nylon,' he began, 'was discovered as a result of research begun purely as a quest for knowledge regardless of its immediate practical value. A group of Du Pont research chemists, headed by Dr. Wallace H. Carothers, believed they could rival nature in one of the most amazing and baffling of

all her chemical feats, the creation of giant molecules. Nylon is one of these giants—of the long chain variety.'

He explained that giant molecules are built up by linking together a large number of simpler molecules in various patterns. In silk, wool, leather and many other common natural materials, the molecules are linked end to end in chains of great length.

'You see,' he went on, 'the secret of the strength of silk and nylon is in the length of its molecular constituents. Physicists claim that these long thin molecule chains, ranged side by side, cling together better and resist rupture because of their length just as the spinner of yarns knows that he must choose long fibres and card or comb them straight if he would have strong threads.'

Jones pulled a tiny woolen fibre from his suit. 'Is this a giant molecule?' he asked.

'I'm afraid there are millions of giant molecules in that single fibre,' the Chemist answered.

'Now you're getting me confused again,' Jones objected. 'Invisible chains of invisible molecules made up of invisible atoms. I don't see it!'

The Chemist pointed out the

window. 'Think of it this way. Imagine your individual wool or nylon fibres as made up of many long rows of box cars arranged side by side like those you see in that freight yard, with the single box cars linked end to end just like they are. If you have enough of these molecular trains, arranged in this way,—and it certainly takes a great many—you have your visible fibre.'

'That makes it clearer,' Jones admitted. 'But do you mean to say that those chemists actually succeeded in making these invisible freight trains?'

'What's more they found the molecular box cars in the coal you've been selling for 30 years.' He took up his notebook and showed how the benzene molecules straightened out to form the units in the molecular chains of nylon. (See second page of Chemist's notebook.)

'The straightening-out process is not as simple as it sounds,' he went on. 'If you want me to explain how the chemist does it, you'd better get ready to duck the big words. It is done by putting the molecules through the successive torturings of pressure hydrogenation, distillation, oxidation, neutralization, dehydration, hy-

drogenation again, crystallization and filtration.'

'Simple as all that?' said Jones with a hearty laugh. 'I'll bet you can't say it again.'

'It's hardly necessary,' chuckled The Chemist. 'You've got the general idea without going through all the details. When they are straightened out these units are linked together end to end by the same type of chemical bonding that characterizes silk and wool. This linking up process is called condensation polymerization and what we have now is nylon polymer flakes. These we must melt, extrude through tiny holes, stretch 400 per cent, twist size and wind on bobbins. We now have nylon yarn and somebody else has still to knit it, sear it, steam it, scour it and dye it before the metamorphosis from coal to stockings is complete.

'Wait a minute,' challenged Jones. 'Where do the air and water fit in? So far you've only mentioned coal.'

'To put it simply,' The Chemist said, 'air and water are brought into the picture by ammonia which is of vital importance in the tongue-twisting list of chemical processes I spieled off a month ago. Ammonia is made from



nitrogen which we get from the atmosphere, and hydrogen, which is obtained from water.'

As he spoke the train jolted to a stop and The Chemist looked out of the window. 'Why, the next stop is mine,' he said. 'Time hasn't dragged on this trip.'

'This has been a lucky break for me,' said Jones. 'Thanks to you I've learned there's more to chemistry—and coal—than I ever dreamed. But there's one more thing that's bothering me. You say these atoms and molecules, even the giant ones, are too small ever to be seen. I can't help wondering how on earth you fellows get at them, how you handle them and make things with them.'

'That's a very natural question,' said The Chemist. 'The fact is that we don't need to see our molecules or put tags on them before we know how to handle them. The science of organic chemistry has enabled us to know in advance how the different types of atoms and molecules are going to behave when they are brought together. We have learned how to break up the combinations of atoms and molecules found in Nature's carbon-containing materials and how to form the new alliances we desire.'

'Sort of a high pressure marriage and divorce agency, eh?' said Jones.

'You're closer to the mark than you may realize,' laughed The Chemist. 'We even have chemical "Marrying Sams", known as catalysts, which have the ability to perform marriages, high pressure or otherwise, between the elements in the molecular world, while they themselves remain blissfully single and unattached.'

'Well, what do you know about that!' said Jones.

'What's more, if any of our tiny customers are reluctant, we don't hesitate to turn on the heat.' The Chemist went on. 'You see, heat increases the activity of atoms and molecules and often causes them to fly apart, thus providing them with opportunities to make new alliances and form new compounds. You've heard of petroleum molecules, which provide a bountiful source of small carbon compounds useful in synthetic chemistry, notably in the production of synthetic rubber which is produced in Canada's great synthetic rubber plant at Sarnia. Again, the extreme heat of the electric furnace is used to cause a chemical rearrangement of atoms. Lime reacts with carbon

in the furnace to form calcium carbide, from which we get acetylene, which is basic in the preparation of numerous synthetic products, for example the synthetic rubber neoprene.'

'Say, that reminds me,' Jones broke in. 'I happen to know you get that coal tar stuff you mentioned earlier by heating coal without allowing any air to get at it. Is that another way of using heat to separate atoms and molecules?'

'It most certainly is,' said The Chemist. 'The process is called coking, and it forms a vapour from which the coal tar is condensed. But perhaps the best examples of the use of heat and pressure in manhandling molecules are to be found in high pressure synthesis, the source of hundreds of useful chemicals serving a thousand and one purposes. Not the least of these chemicals is ammonia, which I mentioned to you in connection with nylon.'

He explained that some ammonia is obtained in the coking process along with coal tar, but the vast quantities of ammonia needed by industry necessitates a more bountiful source of the chemical, such as high pressure

synthesis. 'The development of synthetic ammonia helped free mankind from dependence on diminishing natural nitrate deposits. Ammonia is not only important for nylon, but it is the source of nitrates which are of tremendous value to the nation, in wartime and in peacetime for explosives and fertilizers.

'In high pressure synthesis we really do take our molecules for a joy-ride,' he went on. 'We heat them to terrific temperatures, wash them and re-wash them, cool them hundreds of degrees below zero, expand them to atmospheric pressure, compress them with pressures of thousands of pounds per square inch, and expose them to catalysts.'

'No wonder the molecules combine,' said Jones. 'How could anything resist such methods of persuasion. But you said air and water are used in the production of ammonia. Can you give me a clearer idea of how it's done?'

'It all starts with the coke from our coking ovens,' The Chemist said. He began sketching on a third page of his notebook. 'When air is blown through hot coke, you get carbon monoxide and nitrogen. When you pass steam through hot coke, you get hydro-



gen and carbon monoxide. From the nitrogen and hydrogen so obtained, with the help of compressors, catalysts and heat, you make ammonia.'

'Sounds simple enough,' Jones commented.

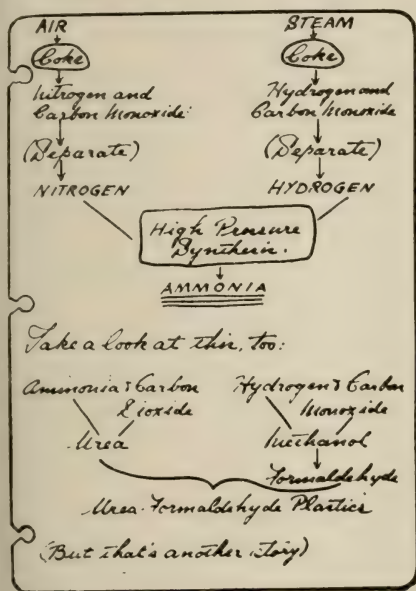
'Simple in principle, but the plant equipment needed is far

give you an idea of its size, the plant pumps enough water to supply a fair-sized city and the daily coal consumption is sufficient to heat a large home for more than a century.'

'Some customer!' Jones said with a covetous note in his voice.

'Here, take a look at these pictures,' The Chemist continued. 'They will give you a much more vivid impression than my words could ever convey of the tools and equipment needed by the modern chemists to break into coal's chemical treasurehouse and make use on a worthwhile scale of its energetic, versatile molecular components.'

'Any time you are tempted to think that turning coal into synthetics is a simple matter, just think of these furnaces belching white hot masses, these towering gas holders, mighty pressure reactors, forests of stills, filters, pumps, blowers, centrifuges, autoclaves and tanks, and the mazes of piping and wiring you see here. On those pressure gauges the needles may be quivering at 10,000 pounds per square inch, these thermometers are probably recording thousands of degrees Fahrenheit, and the flow meters over here register the



Page Three

from simple,' said The Chemist. He began rummaging in his brief case. 'Did you ever hear of the Du Pont high pressure synthesis plant at Belle, West Virginia? To

passage of gases and liquids in millions of cubic feet or gallons a day.

'Planning and directing all this activity are the research chemists, the metallurgists and the engineers in laboratories and workshops, who fashion the formulae, the catalysts, the stainless steels and work out the processes that must first be put together in blueprint form.'

He got up to put on his hat and coat. 'The next time your acquaintances talk about whipping up a batch of nylons out of coal, air and water,' he added, 'you can tell them to stop wondering how to make a fortune out of the contents of their coal bin. The best use they can make of it is still just to burn it.'

'I'm sure looking forward to

seeing some of those fellows again and telling them what I've learned from you,' said Jones. 'But gosh! It does seem a shame to waste so much coal by merely burning it!'

'It's not wasted,' The Chemist reminded him. 'Remember what I told you about the carbon returning to the air as carbon dioxide when the coal is burned.'

Jones' face brightened into a smile. 'Say, that's right. In a sense I'm helping in Nature's carbon cycle—returning or borrowing some of the carbon to make things that Nature didn't provide ready made for us. You know, we're in an interesting business!'

'We certainly are,' The Chemist agreed and made his way toward the train door.

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★ THE YOUNGEST ADULT IN CANADA can remember the despair which swept the country during the depression. In 1938 there were 700,000 Canadians without employment and 1,500,000 people were living on direct relief. Even as late as 1940 the number on relief was scarcely less than three quarters of a million.

Yet today we have full production and full employment. There is a useful job at decent pay for every man and woman who wants to work. If a man does not want to work the law can compel him to do so. Unity of purpose in the struggle against our common enemy has brought about this miracle. We have been united to do something and we have done it.

We shall need the same sort of unity after the war if, as is the declared policy of the government, we are to provide jobs and security for all. In some respects this is going to be a tougher job even than the war itself. Never before in peacetime, not even in boom periods, have we achieved such an objective for every citizen. No wonder then that this is urgent business in the minds of many Canadians.

—A CITIZEN'S FORUM—*Of Things to Come*



# A Hundred Million Tireless Slaves

*If we install a new method of distribution and shorten working hours, our 10 million horsepower of hydro-electric energy can be a blessing; otherwise, we shall be cursed with technological unemployment and reduced consuming capacity in the postwar period.*

OFFICIAL information places the Dominion's present hydro-electric development at 10,000,000 horsepower. Such a volume of electrical production approximates one horsepower of extraneous energy for the use of every man, woman and child in the Dominion.

Like a lot of other scientific data, we are apt to dismiss this item without appraising its full significance, yet around this bit of factual information revolves potentialities and problems directly affecting our future as a nation, and our individual well-being.

On the face of it, 10,000,000 horsepower of hydro-electric energy for the use of less than 12,000,000 people looks like a tremendous asset. From a national viewpoint that conclusion is fully justified, yet from the viewpoint of the masses and their welfare, it could become a serious menace.

Undoubtedly this flood of cheap power (which can be great-

ly increased) places Canada in a position to become a great industrial nation. The almost miraculous expansion of our industrial productivity during these war years attest that fact. An abundant source of cheap power, plus natural resources, plus expert labor, add up to immense productive capacity. Canada has all these things in a measure exceeded relatively by no other nation. From the national viewpoint this Dominion is incalculably rich. Prospects for future prosperity are brilliant.

What about the individual welfare? Look once again at the scientific fact—one horsepower of extraneous energy for every man, woman and child in the Dominion. The energy expressed in one horsepower is equal to the energy of 10 men. In other words, each person in Canada has at his or her disposal the energy of 10 men, each willing and able to work 24 hours a day for 365 days in the year. This means that if

the whole of this available energy is continuously used (as it is now all being used mostly for war production) we could, in a few short years, pile up such stores of goods as to flood not only our domestic market, but plug up a great deal of available foreign market outlets.

That would mean within a limited period the development of a new unemployment problem of unique proportions, unless in the meantime we evolve an entirely new system of distribution and introduce regulation of working hours.

Nor is this by any means a fantasy of the imagination. Productive resources of 1929, together with a retraction of purchasing power, created a world depression of appalling dimensions. But the productive capacity of 1929 has

been far exceeded through the development of more extraneous power, more plants and more trained workers. Add to our present Canadian domestic productive capacity the millions of men and women now engaged in war work or services and some idea is gathered of Canada's vastly increased creative power, yet up to the present moment no change in our economy has been devised to meet the situation.

When world economy has been evolved upon a sane basis actuated only by the purpose of serving the common good, this reserve of energy and productive power will become a boon and a blessing to mankind. Till then it could become a curse to four-fifths or more of the human family.

—The North Battleford Optimist

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★ OTTAWA.—Canadians are paying cash for the goods they want to buy to a far greater extent than a few years ago, it was disclosed in the annual report of the Prices Board. In 1941, 68% of department store sales were for cash. Last year the percentage had reached 76. Jewellery sales were 48% cash transactions in 1941 and now are 70% cash. Cash sales of clothing increased from 53% to 64, and of furniture from 21% to 40.

—CANADIAN PRESS

★ IN NO YEAR since the beginning of the war have newsprint operations in Canada averaged 80% of effective mill capacity. Best years in this respect were 1940 and 1941, when production from Canadian mills averaged 78.3% of capacity and 78.9% of capacity respectively. In 1944, average production of the Canadian mills was equal to only 68% of their capacity.

—PULP & PAPER INDUSTRY



OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN

JULY, 1945

Prepared by Editorial Staff

No. 30

## *Canada's Lumber Industry*

SINCE 1939 Canadian forests and Canadian lumbermen have produced 25,000,000,000 board feet of lumber—more than was ever before produced in a corresponding period of the nation's history. In 1944 alone the output was more than 4,700,000,000 board feet, of which about 43% was exported. Had this all been sawn into ordinary building lumber it would have been enough for the construction of some 400,000 houses or, in another form, for 147,000,000 railway ties—enough for a track around the world.

The sawmill industry proper employs between 40,000 and 50,000 men. Production of sawlogs gives work equivalent to year-round employment for 30,000 to 40,000 men. With boxmakers, furniture craftsmen, wholesale and retail tradesmen, etc., the total may be 200,000. In actual cash, the industry creates new wealth of about \$200,000,000 a year and provides nearly \$50,000,000 in wages.

In view of the immensity of the industry, the question of reforestation is important. Between the cutting of lumber, pulpwood, pitprops, railway ties and other types of wood and ravages by insect and fire, the raw material is probably being used up faster than it is being replenished. Of the total annual depletion of merchantable ma-

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terial, only about 74% is used. The remaining 26% is lost by fire, insects or lack of utilization.

The matter of perpetuating the nation's forest yield is more important than ever, for two reasons: the need to provide employment for the largest possible number of Canadians after the war; the increasing, new and interesting uses for forest products which are being developed. More progress has been made along this line in the last three years than in the previous 100 years.

Forests now yield alcohol, dyes, baking powder, medicines, paints, perfumes, sugar, gumplastics, yeast, ink and hundreds of other items. During the war pulpwood has taken the place of cotton in 'gun-cotton', and plywood has taken the place of metal in the fabrication of the Mosquito, the fastest fighter bomber in the world.

An important feature of these wartime developments in the utilization of wood has been the stimulation it has provided for energetic research. The most spectacular use of wood during the war has been in the field of chemicals. The lead in this direction has come largely from Europe, where shortages have made necessary the use of wood as a source of motor fuel, lubricants, cattle fodder, synthetic rubber, anti-freeze, explosives and a wide variety of other materials. Some of these developments will have only a wartime application, but the mere fact that research has been stimulated may mean much to the forest industries of the future.

Canada is actively engaged in such research. The forest production laboratories under the Department of Mines and Resources have added to their pre-war facilities several new laboratories and much new equipment. These include a glue laboratory, an improved wood laboratory, a wood plastics laboratory, some plywood equipment of a semi-commercial size, a wood hydrolysis laboratory, a large press for fabricating laminated structural units, equipment for moulding plywood over curved surfaces, two high-frequency electric units for work in the rapid setting of glued structures and for use in the seasoning of special units or assemblies and a considerable amount of ancillary equipment. These additions to the facilities have been useful as a wartime necessity, and their part in the post-war encouragement of the forest industries will be great.



At present the greatest demand for forest products is still for the old uses. Of the estimated 4,700,000,000 board feet produced last year, 640,000,000 feet went into boxes and crates, 470,000,000 feet were used by the railroads, 175,000,000 feet by essential mines, 60,000,000 feet for miscellaneous purposes, 1,455,000,000 feet for construction and shipbuilding in Canada, and the balance, amounting to about 1,900,000,000 feet, was exported for war use.

Despite all labour shortages and supply and equipment difficulties, production of lumber in Canada since the war began has averaged nearly 1,500,000,000 feet a year more than production averaged in the 10 years prior to the war. This represents an increase of about 40%. Production in 1944 exceeded that of 1943 by approximately 100,000,000 feet, and 1945 production is estimated to show a further increase of 100,000,000 feet. Despite the fact that Canada has been the main source of supply for the United Kingdom and the British Commonwealth countries under war conditions, and the fact that consumption of lumber in Canada for military purposes has been tremendous, the industry in addition has been able to supply sufficient lumber to provide a substantial increase in housing construction.

The average number of houses built in Canada in the 10 years prior to the war is estimated at 15,000 a year, while the average number during the war has been 27,000 a year—an increase of 75%. There was enough lumber supplied to construct more houses in 1944 than were ever built in any one year in Canada in the 10 years before the war.

If all the sawn lumber and sawn ties are considered together, exports to the United Kingdom in 1944 were virtually the same as in 1943.

On the other hand exports to the United States increased by 152,000,000 board feet, and exports to all other countries, mainly in the British Commonwealth, increased by 44,000,000 feet.

The lumber industry is confronted with a record-breaking volume of orders. Production in 1945 is likely to be approximately 4,850,000,000 board feet. This production is scheduled to come from the provinces approximately as follows:

(Million Board Feet)

NOVA SCOTIA .....	300
NEW BRUNSWICK .....	300
QUEBEC .....	1,100
ONTARIO .....	600
MANITOBA .....	80
SASKATCHEWAN .....	90
ALBERTA .....	195
BRITISH COLUMBIA (interior) .....	435
BRITISH COLUMBIA (coast) .....	1,750
	<hr/>
	4,850

Assuming a postwar production of not less than 4,500,000,000 feet annually, Canada probably can export each year a minimum of 2,000,000,000 feet. For Canadian consumption the making of boxes and crates will require about 400,000,000 feet; mines and railroads, about 600,000,000 feet; new construction and maintenance, 1,400,000,000 feet; and balance of 100,000,000 feet will be used for a wide variety of purposes.

The United Kingdom has already made arrangements to spend about \$140,000,000 for the purchase of 2,400,000,000 feet of Canadian lumber in the two years after the end of hostilities in Europe. In 1940, the year of peak Canadian ocean shipments, exports to the United Kingdom were 1,617,000,000 feet compared to 1,200,000,000 feet expected after the war. Nazi air raids, buzz-bombs and shelling have destroyed more than 1,000,000 homes in the United Kingdom. In addition homes will have to be built for service personnel returning to the British Isles after the war.

Other allied and British countries will also be embarking on new housing programs, and Canadian lumber is certain to be in large demand.

—Canada At War

EDITOR'S NOTE: Because of the expansion of Canada's lumber industry during World War II, this country is in a position to produce the greatest abundance of building materials that this nation has ever known. Are Canadians going to make certain that this vast productive capacity is utilized for the provision of human needs after the war?



## *Fuel for the Lamp of Aladdin*

**H**ISTORY will surely say that America's means of production was the deciding factor in the winning of World War II; that lend-lease enabled us to help equip our Allies—that American production sparked the heroic stand at Stalingrad and the later invasion of France—that it served as the Aladdin's Lamp of World War II.

Yet much of this production would have been impossible were it not for the availability of alcohol which is a necessary component in, among other things, munitions, medicines, synthetic rubber, protective coatings, plastics, shatter-proof glass and lacquers. Nor could the production of alcohol have been possible on the present huge scale, were it not for the equipment in the beverage distilleries available for immediate conversion as soon as it was needed after Pearl Harbor.

When the War Production Board ordered complete conversion in October 1942, about half of the distilling industry's volume, represented by some 35 of the largest distillers, was already concentrated on war alcohol output. The new order applied only to high wine producers, comprising the remaining 90 of the country's 125 distilling companies.

In 1943, the beverage distillers produced 227.8 million gallons of 190-proof alcohol or more than half of all production: it is estimated that their output will account for about 45% of all 1942-44 alcohol production.

The production of industrial alcohol during the first World War did not play nearly as important a role as it does today. Prior to 1918, the only alcohols available to industry were methyl, ethyl, a mixture of the amyls (usually sold as fusel oil), and glycerol. However, the utilization of butanol in the lacquer industry and the rapid growth and expansion of the latter stimulated interest in other alcohols. Thorough investigation of methods of synthesizing these products has resulted in their commercial production, and at the present time, many alcohols are produced synthetically.

Alcohols, characterized by the fact that they contain the hydroxyl (OH) group, are the most important industrial organic group of chemicals. Lower alcohols are well known as anti-freeze compounds, solvents, germicides, and antiseptics; higher alcohols are known as general extractants, anti-foaming and flotation agents, while their sulfate salts are excellent wetting, emulsifying and cleansing agents. Chemically, alcohols are valuable starting points in the manufacture of many other products, such as its wide use in dyestuffs, drugs, cleansers, polishers, extracts, while in solvents it serves excellently for most gums, alkaloids and oils. It is also used in rubbing compounds, lotions, liniments, liquid soaps, and antiseptic solutions. The extensive use of alcohol is further illustrated by its presence as an anti-foaming agent for the photographic, varnish, paper coating, rubber latex, textile, printing, and ceramic industries. We find solvents widely used in many industries and for a variety of purposes. Consider, for example, their use in fire extinguishers, in hydraulic fluids for automobile brakes, and the very large use of alcohols for anti-freeze purposes, which makes possible, in difficult atmospheric conditions, the operation of not only the automobile, but also the aeroplane, tank, jeep, etc. The chemical industry is quite dependent upon the alcohols as solvents, for purification, extraction, and in crystallization processes; while the food and beverage industries utilize ethanol, glycerol and propylene glycol as solvents for the essential oils and coloring materials used in flavoring extracts, as mold inhibitors, and in other products.

Alcohol finds many uses on battlefields. Russian scientists not long ago developed a daring and novel method of using alcohol in abdominal operations. Directly after an abdominal wound has been closed surgically, from 50 to 70 cubic centimeters of distilled alcohol are pumped into the intestines, along with other food. This treatment, which usually takes place on the operating table, warms the pale and sick patient and eases him off into peaceful sleep.

One of the most dramatic examples of the myriad uses of alcohol was found in press dispatches and subsequently portrayed in a motion picture **Destination Tokyo**, which described how an emergency appendectomy was performed by a pharmacist's mate who tapped



a torpedo for the necessary alcohol to sterilize his makeshift surgical instruments, there being no other available antiseptic at the time.

Shortly after the United States was forced into the war with Japan, the Japanese seized virtually all of the natural rubber producing areas of the world and left America dependent on a brand new, untried synthetic rubber industry for its war needs. The stirring record of achievement of the synthetic rubber industry is history now, as is the vital role of the distillers which is best illustrated by the statement of Dr. Walter G. Whitman, assistant director of WPB: ' . . . it is fair to regard the rubber manufactured to date as being almost solely the product of the beverage industry which contributed 410 million gallons of alcohol to the war program, while the demand for synthetic rubber, direct military and lend-lease totalled 405 million gallons.'

Large quantities of alcohol are used in the manufacture of smokeless powder, each 16-inch shell consuming the equivalent of 19¾ gallons of alcohol when it is fired. The smokeless powder in a 155 mm howitzer high explosive shell requires the expenditure of almost half a gallon of 190-proof alcohol.

When the Allied armies first cracked the Normandy coast in the initial invasion of Hitler's European fortress, it was unofficially reported that 500,000 men were involved in the first invasion waves. It was announced that each man was equipped with three hand grenades. On the assumption of a 500,000 man force, that phase of the invasion preparations alone required almost 23,500 gallons of 190-proof alcohol.

Torpedoes, the tin fish with a sting, are being used with deadly effectiveness by submarines, destroyers and other naval ships. Few facts have been released by the Government regarding the construction and the use of torpedoes by either ships or planes, but it has been estimated that approximately 40 gallons of alcohol are used in the manufacture of a torpedo.

Any discussion as to the uses of alcohol during wartime would be incomplete if it failed to take into consideration the important medical use to which alcohol has been put for war.

Alcohol is one of the important raw materials in modern medicine

and is now saving countless thousands of lives on the scattered battle-fronts of this war. In the medical field, alcohol is used for sterilization and antiseptic purposes, and in a wide variety of drugs, basic medicinal chemicals and biologicals. Alcohol is an ingredient in ether and chloroform, sulfa drugs, aspirin, atabrine (a quinine substitute for fighting malaria), and in military protective salves. A new medical product of the distilling industry is the wonder drug of World War II, penicillin.

The introduction of a new alcohol is usually followed by a large number of its derivatives, and in the years to come there will undoubtedly be a number of new alcohols produced. It is expected that new synthetic methods and improvements in the older processes, coupled with the demands of industry in the postwar years, will further stimulate the development of new alcohols and new solvents.

—Jack J. Glasser in *The Crown*

*EDITOR'S NOTE: Under the skilled research of our technologists during World War II a myriad of uses for industrial alcohol have been developed. These technologists are the real leaders of our Power Age civilization and the march of events will soon force upon them the overall direction of all social operations in North America.*

## *White Harvest*

CRYSTAL-COVERED 'lakes' dotted across the Canadian prairies yield each year an unusual and valuable harvest of a widely used chemical compound, sodium sulphate.

For years the people on the prairies called the places 'stink holes.' The white alkaline deposits not only gave off a strange odor but in high winds they blew across the landscape like chalk. Then people began to find some value in these deposits, and, as so often is the case, they found these values purely by accident.

A farmer, homesteading near Palo, Saskatchewan, about the turn of the century, bought some Barred Rock hens, thinking they would bring in a little extra money. One day he was prowling along the shores



of White Shore Lake and happened to pick up some crystal-like deposits. He took the crystals home and mixed them with the chicken feed. His Barred Rocks ate the feed with disturbing results—for the crystals were crude Glauber's salt, used extensively as an aperient or purgative for cattle, horses and sheep.

Although the existence of natural deposits of sodium sulphate in Western Canada was well known more than 45 years ago, not until World War I was serious attention turned to these resources. The search for potash at that time led to the staking of claims on many of the saline lakes on the prairies. While they didn't find useful deposits of potash, this activity led to the discovery of large reserves of sodium compounds, principally in the form of sulphates.

Geologists suggest that the source of the salts in the deposits of Western Canada is from the unconsolidated drift material which covers practically the whole of the western plains. Circulating meteoric waters carrying calcium salts in solution release the sodium salts in the bentonite of the drift and these are in turn concentrated and deposited in the undrained lake basins in the surface deposits as found today. The meteoric waters which carry the salts into the basins may be surface drainage, seepages, or springs. There is no drainage outlet to these lakes and constant evaporation over the years has concentrated the weak solutions into the strong ones—an example of the work of nature's own laboratory.

Investigation of the deposits in White Shore Lake was undertaken by Canada's Department of Mines during 1924 and it was estimated that approximately 19,760,000 tons of hydrous salts existed in the 1,860 acre lake, which is  $10\frac{1}{2}$  miles long with an average width of half a mile. The deposits vary in depth from three to seven feet with an occasional depth of from 10 to 14 feet.

Today the expanse of snowy White Shore Lake is the heart of a thriving industry, with the plant of Midwest Chemicals Limited shipping thousands of tons of sodium sulphate each year. The bulk of this output is sold by the General Chemicals Division of Canadian Industries Limited.

Tens of thousands of tons of the dehydrated crystal, known to the trade as 'salt cake', are required each year in the manufacture of

kraft paper by the sulphate process, which was first introduced in Canada in 1907. The fibre obtained by the sulphate process possesses unusual strength and flexibility. Roughly speaking, 350 pounds of salt cake are required for each ton of sulphate pulp produced.

Canada's glass industry uses sodium sulphate to lower the melting point or viscosity of the liquid glass. Substantial tonnage of salt cakes are used in the smelting of nickel and copper ores, and in various branches of the chemical industry salt cake is an important ingredient.

Sodium sulphate, as it occurs in these deposits, is in the hydrous form of crude Glauber's salt which contains 56% water on crystallization, or in solution as a brine. Since very little of the material can be marketed in either of these forms it is necessary to purify or dehydrate it before a marketable product is obtained.

The harvesting of sodium sulphate is simplicity in itself. The whole process is governed by rainfall and melting snow. The water accumulating in undrained basins is often a foot or two in depth and carries a considerable quantity of the salts in solution.

In the late summer and especially in dry seasons the so-called lake becomes a huge deposit of crystallized salts. But when the seasonal rains or melting snows dissolve these crystals, the brine formed is pumped into a 23 acre reservoir where re-crystallization takes place and the almost 100% pure crystal is formed.

These deposits are harvested by modern methods, utilizing tractors with scrapers that look not unlike the bulldozers used for earth-moving projects such as highways and airdromes. Scrapers and a fleet of trucks combine to pile up huge reserve stocks at the Midwest Chemical plant thereby assuring continuous operation at the next stage.

A drag scraper hauls the raw salt from the stock pile into the plant where it is fed into three revolving drums, each 80 feet long and 7 feet in diameter. The furnace at the end of each drum maintains a temperature sufficient to drive off all the moisture and water of crystallization. The salt cake leaves the furnace end of the drum and now weighs 2,600 pounds per cubic yard as compared with 1,400 pounds to the cubic yard in its original state. From the



furnace it is taken to a screening and grinding operation where the salt cake is screened and ground to a marketable size.

By this moisture-removing treatment important savings are made. The original material, containing 56% water by weight, could be shipped in its raw state. But freight rates have to be added to the cost at the plant before the material can be landed at the larger markets which exist in the East. The conversion to salt cake, although adding to the cost of production, is a case of spending money to save money. Incidentally, the raw solution in the lake also contains some magnesium which is considered an impurity in most uses of salt cake and is therefore removed in the harvesting operation.

The finished dry salt is stored in a silo and shipped in bulk carlots as required by the trade. Canadian sodium sulphate is recognized as being a superior product because it contains virtually no free sulphuric acid or iron, and is not likely to form hard cakes or lumps during shipment or storage.

Looking like a huge snow drift, a stock pile of 150,000 cubic yards—representing 100,000 tons—of the raw deposit is generally maintained at the plant. The buildings, whitened by the blowing salt, look like something in a Christmas setting when viewed from afar against a blue prairie sky.

Midwest Chemicals Limited was organized in 1938 with Saskatchewan capital. Situated two miles from Palo, practically a whistle stop on the C.N.R. main line about 70 miles west of Saskatoon, the works is complete in itself, even to a school for children of the employees.

From a small and struggling beginning the company is today among the leaders in the sodium sulphate industries on the prairies. Its equipment is entirely modern, two big diesel units providing the power for round-the-clock operations that turn out a 'white harvest' that is shipped throughout the Dominion.

—Kenneth Liddell in C-I-L OVAL

*EDITOR'S NOTE: Canada is a treasure trove of natural resources. When they install technological control of social operations the people of this country will utilize those resources for the benefit of all citizens with a maximum of efficiency and a minimum of waste.*

## *New Glass Products*

**G**LASS, ancient building material, in recent years has recaptured the imagination of industrial designers, architects and the public, and its added forms and uses appear to assure the material unusual prominence in postwar construction.

Recent experimentation, in many cases speeded by war, has developed some surprising products from this centuries old window material.

Glass ingredients now are emerging in blocks of foam-like materials or mats of a wool-like substance for heat insulation in walls and roofs; in fibre twisted into yarn for fireproof and mothproof textiles; in glass-plastic for molded structures and wall materials.

There are entirely new kinds of the ordinary transparent substance familiar in bottles, tumblers, windows, windshields and the like—safety glass that can be bent like heavy rubber; 'case-hardened' plate in solid glass doors.

And strange things have been done to ordinary plate and window glass so that it now appears in a dozen guises—glass that you can see through only one way; glass containing tint compounds that filter out the bleaching effect of sunlight, or that permit entry of energizing violet light, or that exclude sun heat in summer; glass in double or triple-size windows which provide heat insulation because they have two or three panes sealed together at the edges.

These are some of the glass industry's newer products for homes, offices and factories and many of them already have been released for civilian use. Some of them arrive with fairly high price tickets, but the industry holds out hope of cost reduction by the time the popular market and low-cost home have been reached in the course of distribution.

Canada's glass production is almost entirely confined to what the trade calls 'crown glass' used in making blown or molded containers. In the past, several factories set up to roll or cast flat glass for windows have had to abandon operations—they could not compete



with imported glass.

Pre-war, our imported glass came from Belgium, the largest exporter, England second, United States third; British glass came in duty free, but there was a 15% impost on the American product and 12½% on the Belgian. Incidentally, it is cheaper to ship from Europe to Vancouver via the Panama Canal than to send it overland from Montreal to Winnipeg.

The world's leading glass firms are represented in Canada, plants here trimming and bevelling imported glass for dealer distribution.

Fine fibres or filaments of glass represent one of the newest of new glass materials. Developed in United States by Owen-Corning Corp., it is made in Canada by Duplate Co., Oshawa, under the name 'Fiberglas.' It first proved valuable as an air filter but just before the war was being woven into all-glass fabrics that defy wrinkling, wear, moth or flame attack. Since then the fibres have been made smaller and, with production by Owens-Corning of a filament .00002-in. in diameter, a white, fluffy wool-like mass of glass has emerged for a new role in thermal insulation of buildings and machines. Today, it is used to insulate high-altitude bombers; soon it will be available for home building.

Before the war, European architects in France, Germany and Sweden led a trend in architectural design—houses, factories, department stores, hospitals, schools, etc.—featuring entire walls of glass. It was not long before this trend embraced Britain and began to take in the Americas.

Current industrial design in Canada, for example, features ever wider expanse of glass for factory walls and roofs and glass experts and some architects predict extension of the trend to commercial and residential structures.

Wide corner windows and almost wall-size windows generally now can be built into houses without danger of heat-loss in winter. Already in Canada, houses—so far in the higher cost category—are appearing one by one with 'picture' windows of this kind, affording a new degree of interior daylighting, spacious view and something entirely new in window insulation.

These windows are fabricated of high quality glass for clear

vision; they are made up of two, three or more panes welded together on all four edges by a newly developed metal-to-glass bond.

The problem that has always faced architects seeking the advantages of sunlight has been that although ordinary glass let in the warm rays of the winter sun, the heat was immediately dissipated by conduction. Windows were bitter cold to the touch; their chill resulted in frost deposits; they 'padded' the fuel bill.

Discovery of a method of bonding metal to glass has resulted in development of 'transparent insulation,' i.e., metal-sealed double-pane windows that exclude the cold by utilizing the captive air principle that is the foundation of most thermal insulation. Placing one's hand on the inside of a double-glazed window on a winter's day is like placing it on a solid wall. The inner pane never becomes cold enough to frost or mist. Instead of robbing the coal bin it imports so much warmth from the radiance of the sun on a bright day that the heating system must be checked.

Eventually, say some farseeing architects, even low-cost houses may be equipped with adaptations of this type of window.

Commercial and residential applications of 'case hardened' glass appear certain to expand rapidly. It will bend, twist and can resist hard knocks and wide temperature variation. It is a natural glass manufactured from ordinary polished plate and as there is no introduction of an organic interlayer there is no change in transparency or discoloration even with years of use or when the glass is subjected to severe changes of temperature.

Its toughness is illustrated by the window of a 'blitzed' British hospital which stood heavy bomb shock without splintering, even though sections of the metal case were blown off.

The glass in various thicknesses is already gaining use for windows, partitions, entrance doors and kitchen equipment. It is recognized as standard equipment by Canadian automobile manufacturers. Its protective qualities lie in the fact that on breakage it does not fly into splinters with razor-like edges, but disintegrates into small pieces which are neither large enough nor sharp enough to cause serious injury. This type of fracture occurs because of the stresses set up in the glass by the hardening process.



These, the new fibre, 'wool,' cloth, 'foam,' the new flexible and safety glasses, the new double-glazed picture windows and the rest, are just some of the new materials for postwar building from an industry which, though among the oldest, undoubtedly is among the most progressive and research-minded.

—Financial Post

EDITOR'S NOTE: *This article on glass is merely a sample of the revolutionary developments that are changing our physical world. In every industry tremendous technological advancements are taking place. Because of these, North Americans are on the threshold of a new civilization.*

## *Canadian Telephone Industry*

ACCORDING to figures recently released, the number of telephones in service in Canada continued to increase in 1943 reaching a new peak at 1,692,162. This was an increase during the year of 64,387 or 4%, and an increase during the past 10 years of 499,832 telephones or 42%. The largest gain during 1943 was in two-party lines, which increased by 32,421 or 7.4%. Private branch exchange and extension telephones increased by 13,638 or 4.4%, although residence extensions decreased by 1,294, or 2.6%; this was due to restriction and the tax on such extensions. Telephones on individual lines increased by 6,485 or 1.2%, on 4-party lines by 1,979 or 8.9% and telephones on rural lines (more than four to a line) increased by 9,026 or 3.4%. The other 838 of the increase were public pay telephones. The number of telephones on automatic switchboards (dial telephones) increased by 30,588 or 3.3% and on manual switchboards by 33,799 or 4.3%, each class retaining the same relative position to the total as in 1942.

The estimated number of conversation or completed calls included a count of 50,347,917 long distance calls and an estimate based on counts by large systems on representative days of 2,929,446,000 local calls, or a total of 2,979,793,917 calls. This was a slight reduction in the local calls from the 1942 and 1941 estimates but a new high record for long distance calls. The big increase here was in calls between Canada

and the United States and Alaska; trans-oceanic calls, except to and from Newfoundland, practically ceased, and calls to other western hemisphere countries were reduced also.

The revenue from long distance calls increased from \$24,056,705 in 1942, and \$15,636,249 in 1939 to \$28,550,436 in 1943, whereas revenue from subscribers, renters, etc., increased from \$56,310,788 in 1942 and \$47,501,533 in 1939 to \$58,786,854. Total revenues increased from \$87,057,252 in 1942 to \$94,406,757 or by 8.4%. The Federal excise tax on long distance calls increased from \$2,269,070 in 1942 to \$3,409,070 and on extension telephones the tax increased from \$39,116 to \$146,968. This latter tax was effective from June 24, 1942. Taxes paid by the telephone systems increased from \$12,402,630 in 1942 to \$15,286,611 or by 23%. There was an increase in the number of employees from 20,360 in 1942 to 20,694 or 1.6% but salaries and wages were increased from \$31,580,290 to \$33,581,699 or by 6.3%. The increase in pole line mileage was 744 miles or 0.3% and wire mileage increased by 43,284 miles or 0.7%.

The Bell Telephone Company, with head office in Montreal and operating in Quebec and Ontario, reported 956,113 telephones or 57% of all telephones in Canada and its subsidiaries account for another 4%. The provincial systems in the three Prairie Provinces accounted for 177,919 telephones, or 10.5% of the total. These provincial systems provide long distance service to the local systems and except in Edmonton which operates a municipal system, they serve the large cities in these provinces. In the eastern provinces the provincial systems are mainly in the provincial parks for fire rangers, etc. and the Dominion systems are in outlying sections of the country where no commercial service is available.

#### —Agricultural and Industrial Progress in Canada

★ THE NATIONAL INCOME reached a high level of \$4,600 million in 1920, and fell off 24% in the following year. Recovery was continuous until 1929, when maximum of \$5,273 million was reached. The depression low point was 1933, when the national income was only 52% of the 1929 total. There was a temporary setback to recovery in 1938, and the subsequent advance has been greatly accelerated during the war years, with a total reached in the twelve months ended September (1944) of practically \$9 billion.

—THE ROYAL BANK OF CANADA



# Fuel For the Human Engine

*Human food is just as much a fuel as is coal or gasoline or wood . . . The laws of thermodynamics are no respecters of persons, and they hold as fast and as rigorously in the case of the human body as they do in man-made engines.*

—TECHNOCRACY STUDY COURSE

**M**OST people look upon food as something more than a mere fuel, the intake of which keeps their mechanism going, but it is basically just that . . . The supplying of food is the greatest business on earth, with more than two billion people eating about 3 billion meals every day. In fact man's first, most vital and largest activity is the growing, preservation and distribution of provisions for mankind. It is the function of the food industry to provide place, form and time utility. It must take the raw product, process it, preserve it, and deliver it to the market where and when it is needed, with all possible of its native flavour, nourishment value and good appearance.

We have come a long way since the walking ape-man played scavenger to the sabre-toothed tiger, and from the time, about 12,000 years ago, when Neolithic

man learned to cook, to bring in to domestication oxen, sheep and swine; to milk cattle, to cultivate wheat and barley and to make bread. We are quick to forget how recently many foods now classed as necessities have become available to us. Even 50 years ago the living standards that are commonplace in Canada today were utterly unknown. The food industry, by intelligent application of our natural resources, invested capital, mechanical power and inventive genius, has made it possible for every Canadian to have more of the products that contribute so much to our comfort and well-being.

A few glimpses from history might make the contrast more striking. In the reign of Charles II there was no means of preserving meat except in salt, and during several months every winter even the gentry tasted scarcely any fresh animal food. In the reign of Henry VII fresh meat was never eaten except during

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the short interval between mid-summer and the end of September. Wheat bread was seldom seen in Charles' reign on the tables of even the middle classes, the great majority of the nation living almost entirely on rye, barley and oats. Macaulay records in his history that in the 17th century the holidaying gentry of Derbyshire repaired to Buxton, where they were crowded into low wooden sheds and were happy to live on oatcake and mutton.

The eight generations that have lived since the days of Charles II have seen great changes take place in diet and standards. Not only scientists, but the common people, know a great deal about nutrition, and business has kept pace by placing the needed foods at the people's disposal. We are able, today, to express in quantitative terms the nutritive requirements of individuals. We know the function and source of the vital vitamins. We know the consumption of calories in various types of work. There remain only education and distribution, to see that every citizen receives the energy-giving and health-protecting foods he requires.

This is not the place to discuss in detail the relative amounts of

carbohydrate, fat, protein and mineral necessary for an adequate diet. In fact, so long as a diet gives enough calories there is no need to measure its individual constituents so far as sustenance is concerned.

There was a steady improvement in the supply and quality of Canadian diet up to 1944. From a prewar level below that of the United States in almost all food-stuffs, the general increase in Canadian consumption had brought supplies of nutrients to approximate equality with the United States, with the outstanding exception of ascorbic acid. The total food supplies entering into civilian consumption, distributed broadly in accordance with physiological needs, would be sufficient to meet nutritional intake requirements for health, moral and working efficiency.

A prewar United Kingdom survey disclosed upwards of thirty million persons subsisting on inadequate diets, and this total included twelve to twenty million who had the money but were not getting the necessary nutritive value from the foodstuffs they bought. The question of nutrition, too, includes two major problems: how to put everyon



in the position to secure the minimum of foodstuffs necessary for subsistence, and how to make sure that people who can afford enough food are not malnourished through ignorance or carelessness.

A survey of nutritive intake in regions of Canada disclosed that the difference in regard to calories, protein and iron were not great, but in respect of calcium the Quebec families had the smallest percentage of the estimated requirements, and those in the Maritimes showed a marked deficiency, while in the other provinces the consumption in urban wage earners families appeared to supply nearly the full requirement as specified in the Canadian dietary standard. The report showed that within the family the worst fed member is the mother, the best fed the father or chief wage earner and the younger generally fared better than the older children. Differences between British and French families are small. The French group consumes slightly more bread and slightly less milk and fewer eggs, more potatoes but less fresh vegetables and fruits, and slightly more pork and less sugar.

Inadequate and unbalanced diets are the sole cause of certain diseases, and important factors in lowering resistance to illness generally. A lot of nonsense has been written about vitamins, but nothing can detract from their importance in the human diet. Deprived of vitamins, the body functions badly or not at all in utilizing the other food elements. It has been found that the number of calories can be reduced drastically without permanent harmful effects, if the supply of vitamins and minerals is maintained at an adequate level. On the other hand, if calories were maintained and vitamins drastically reduced, the victim might die with a full stomach.

Persons interested in a detailed discussion of the part vitamins play in human well-being can find it interestingly set forth in **Vitamins and Health**, by Borsook and Huse, while the Canadian situation is well covered in the report of the Combined Food Board Committee published in Canada by the King's Printer under the title: **Food Consumption Levels in Canada, the United Kingdom and the United States**. There is space here for only a brief mention of the most important vitamins. An adult needs 5,000 In-

ternational Units of vitamin A daily, and this may be had in whole milk (220 to 300 units to the glass); cheese (900 units to the ounce); butter (600 units to the tablespoonful) and eggs (500 units each). Vitamin B has been called the modern scientific substitute for the sulphur and molasses, bitters and tonics of the last generation, with the difference that vitamin B is effective, when used intelligently. B is not one vitamin, but many, hence the term 'Vitamin B Complex.' Of B1 a moderately active man requires 600 units daily, and a woman 500; of B2 the requirements are 3 milligrams and 2 milligrams daily. Vitamin C, the anti-scurvy vitamin, is needed in the amount of 800 to 2000 International Units. Canadian supplies of vitamin C in food exceed the average restricted intake requirements, and are appreciably below the average recommended full intake requirements, while both the United States and the United Kingdom supplies show a substantial excess. Principal among common sources of vitamin C are oranges, lemons and grapefruit, while tomato juice has about one-third to one-half the vitamin C content of the citrus

juices. Potatoes have been, for a century and a half, the leading source of vitamin C for many people, especially when cooked in their skins, and were recognized as an anti-scurvy protection long before the real cause of the disease had been discovered by science. Vitamin D, of which a deficiency causes rickets, is peculiar among the vitamins because it is created as a result of the sunshine falling on the skin.

So far as the general supply of foods entering into civilian consumption in Canada throughout the war period is concerned, the significant fact is that there has been a substantial increase over the prewar 5 years. In 1944 the following were representative percentage increases over prewar: milk and milk products 20; meats 32; poultry, game and fish 6; eggs 21; oils and fats 4; tomatoes and citrus fruits 53. On the other hand, there had been a decrease in consumption of some foods, by the following percentages: sugars and syrups 11; tea, coffee and cocoa 2. It is interesting to note that the United Kingdom increased its use of milk and milk products 26%, potatoes 61% vegetables 47%, grain products 17% and eggs 2%, while it de



reased in every other food classification by amounts ranging from 0% for tomatoes and citrus fruits to 16% for fats. The United States increased consumption in all but 3 classifications.

Spendable income of Canadians last year was about \$3 billions higher than in 1939, and as other commodities became scarcer, Canadians spent more than ever on food. Up to November, wholesalers had sold 12% more groceries by dollar value and 10% more fruits and vegetables than in the same period in 1943. The food cost of living index has fluctuated as follows: 1929—134.7; 1939—100.6; 1944—131.3.

Giving credit where credit is due, the farmers of Canada deserve praise for the splendid way in which they have produced food in such great quantity in spite of shortage of help and dearth of machinery. This fine effort has made it possible to meet the increased demands of civilians for meat, vegetables and dairy products, while keeping up a high level of exports to the United Kingdom and other United Nations.

Meat production, on the increase since war broke out, reached new heights in 1944, when

slaughterings of hogs and beef cattle were the largest in history. Meats and poultry, excellent sources of high grade proteins and certain vitamins of the B group, are all important in the nation's diet, and it was a relief to health authorities as well as to consumers when the rationing was suspended a year ago. The great volume of livestock placed considerable stress on handling facilities, and packing plants were strained to the utmost while transportation, cold storage, stock yards and other agencies were utilized to capacity. Beef is expected to remain in abundant supply this year, but reduction of the number of hogs on farms may mean a somewhat less plentiful quantity of pork products. Domestic supplies of mutton and lamb may be lower, as a result of the opening up of export of sheep and lambs to the United States.

Milk in any form is an economical source of proteins of high quality, calcium and riboflavin, as well as of other vitamin and mineral elements. It is the most complete single food. It seems as if 1945 will see demand again in excess of supplies, but much depends upon the pasturage conditions of summer. Most recent

figures show the percentage utilization of Canada's milk supply as follows: fluid 35; butter 48; cheese 11; evaporated 2; ice cream 2; other 1. The civilian demand for fluid milk has increased steadily until it is now 17% above the prewar level. Cream sales were, of course, frozen at the June 1944 level. Butter production decreased 5% last year, and stocks continue to give concern to the authorities. The bulk of sales go to consumers who get 80% of the quantity available for distribution. Dried whole milk is an important product, the principal civilian use of which is in the food industries, though about half the total production is reserved for priority uses such as Red Cross prisoner of war parcels. Each parcel contains one pound of dried milk powder, and parcels are being shipped at the rate of 140,000 weekly. Another priority use is for the armed forces in remote areas where fresh milk is not obtainable. Civilian consumption of evaporated milk has increased greatly, so that prior to imposition of restrictions of sale in places where fluid milk could be obtained, the supply was inadequate in needy areas. Cheese

production was maintained in 1944 at a level sufficiently high to take care of the 125 million pound British contract, and to provide a slightly greater amount for civilian use. It is expected that the quantity available for use in Canada this year will be about the same.

The supply of leafy, green and yellow vegetables, so important for their vitamin C and pro-vitamin A content, is a problem in a country like Canada, because of the short growing season and the high cost of imports. Supplies of leafy vegetables per capita in the United Kingdom in 1944 exceeded the United States supplies by 44% and the Canadian estimate by 124%, private production in the United Kingdom having risen by 15 pounds per capita, largely as a result of the 'dig for victory' garden campaign. These figures are supplied by a special joint committee of the Combined Food Board.

Grain products are important in the food picture as inexpensive sources of energy and protein, and they also supply iron and certain vitamins of the E group. Canadian flour millers are operating at the maximum level allowed by the available



worker supply, at just below theoretical full capacity. This is one of Canada's oldest industries, dating from 1607, when the first mill was built in Port Royal, now Annapolis, Nova Scotia. From that beginning, the industry has grown until, in the 1943-44 crop year, Canadian flour mills processed 110 million bushels of wheat. The present war has witnessed a revival of flour export, attaining a record in the 1943-44 crop year of 13.5 million barrels. Exports absorb from a third to a half of total production, and are highly important, therefore, to the welfare of the industry.

Bakeries, too, have been operating at or near capacity, the only limiting factor being the shortage of labour. There is an increased per capita consumption of bakery products due to the sugar rationing, the number of women working and the greater availability of ready cash.

Sugar and other sweet products such as syrups, molasses, honey and preserves are of importance in supplying food energy and in adding flavour. When first known to the world, sugar was used as a medicine, then it became a luxury, and now it is a necessity of everyday life. In

the war with Napoleon, when the British blockaded the French ports, they cut off the supply of cane sugar. This drove the French to develop the beet industry, and at the close of the nineteenth century the world's output of beet sugar exceeded that of cane sugar; today about one-third of the total output is from beets. In Canada in 1943 beets provided 15% of sugar production. Development in sugar beet production has had an impetus since the war started, and this industry is expanding in northern countries, close to densely-populated markets. Russia has developed a method of concentrating beet juice into solid blocks at the scene of the harvest to reduce transportation costs. The demand for sugar in Canada is in excess of the supply, refiners having been forced to operate on a curtailed basis due to difficulty in getting raw materials.

Fats and oils provide the most concentrated sources of food energy, besides having great importance in cooking, as spreads for bread, and for adding flavour. They are particularly important to heavy workers, because they reduce bulk and thus enable the workers to absorb their high

calorie need. Supplies available to Canadian civilians are not likely to be higher in 1945 than in 1944, and continued economy in their use is needed.

Fish has never been a big item in Canadian diet, and supplies for the domestic market are expected to be equal to the demand, though variety may be limited. Most of the salmon pack will again go to Britain, but **Consumer Facts**, published by the Wartime Information Board, expresses the opinion that a small amount will be available for civilians. The contribution of the fish industry to the United Nations food supply is important, with current agreements calling for delivery of 140 million pounds of canned salmon, and 1¼ million pounds of sardines.

The domestic supply picture in regard to eggs is very good, while exports to Britain of shell eggs should increase. It is expected that in this year some 1½ million cases will be sent, equal to one extra fresh egg a month per capita.

Supplies of poultry are abundant in Canada, in addition to exports to the United States and over 2 million pounds dressed

poultry shipped to Britain last year.

A good word must be said about the food manufacturers and distributors, who have overcome wartime difficulties, kept up the standards of their goods and made them available where needed. It has been a tremendous task. Food manufacturing is a big industry, with 8,500 establishments employing 115,000 persons, to whom it paid, in the latest year recorded, \$128 million in salaries and wages. The capital invested is \$550 million, and the gross value of the products in the year was over \$1.1 billion. Figures given at a McGill University lecture indicated that food processing represents 34% of manufacturing establishments in Canada, 12½ cents of every dollar invested in manufactories, better than 15% of employees, and 22.6 cents of every dollar of manufacture.

The demand for canned goods of all kinds remains high, and easing of the tin situation will help the industry to meet the rising requirements of housewives for quickly prepared foods. Seasons are not so important now as formerly in relation to food. Fruit and vegetables are available at all times of the year, re-



aining much of their flavour and attractive appearance, as well as their dietary usefulness. Canada's canning factories, which produce at the rate of about \$30 million a year, compared with \$14 million at the close of the last war, are in excellent condition. They are kept spotlessly clean, and high hygienic standards are demanded of employees. Everything entering into manufacture must be sound, wholesome and fit for human food.

Canada was the first country in the world to have special legislation for canned foods, and at the same time it was required that all packages must be marked with a true and correct description of the contents. This is a safeguard to the consumer and to the conscientious merchandizer. Grading saves time for the consumer by enabling him to buy exactly what he wants, and no more. It saves money, because there is less waste. It provides a standard by which goods may be bought at long distance, without personal inspection.

Standards are particularly important in export trade, where purchasers must be assured of the exact type of commodity they are to receive. Surplus food-

producing countries are preparing for an expansion of their export activities, and, as has been pointed out in previous articles in this series Canada must be to the forefront in seeking to dispose of her food produce. This is not something to be taken casually; it is a problem that cannot be brushed off, or laid aside for future consideration. It is a problem that will face Canada squarely now that the German war has ended. According to the Economic Annalist of the Dominion Department of Agriculture, Great Britain plans to maintain a high level of production; Russia looks forward to new crop acreages aggregating several million acres yearly; China envisages a 14% increase in plant products and much more in livestock; India is figuring on raising agricultural production by 100% in 15 years. All of this means that in regard to disposal of its food production Canada needs aggressive thinking and dynamic action.

In spite of the amount of food Canada produces (and she exports around \$440 million worth annually) it is necessary for her to import edibles worth about \$100 million. This amount includes fruits, nuts, vegetables,

grains, vegetable oils, cocoa, coffee, spices, tea, fishery products and meats, commodities which cannot be grown in Canada, because of climatic conditions or because of economic factors. Take tea as an example. It cannot be produced in Canada, yet Canada is predominantly a tea-drinking country, with an annual consumption normally averaging about 3½ pounds, or 700 cups per capita, an amount exceeded only by Great Britain, Australia and New Zealand. The Empire Tea Bureau reports that 95% of Canada's peace-time consumption is of black tea, mostly from India and Ceylon. Today, of course, with green tea from Japan cut off, imports are 100% empire black tea. The average purchase of Canadian families is more than 15 pounds per year, and 93% of Canadian families are regular tea

buyers. A poll taken during the darkest days of rationing revealed that more people missed tea than any other food item except sugar. A peculiar feature is seen in the breakdown of the income classes: while 83% of families in the highest income brackets buy tea, the percentage increases steadily to 94% for the lowest income class. Tea is imported into Canada to the extent of about \$20 million a year, equal to 8 billion cups, because Canadians find it economical and satisfying, and it is a 'must' on our import list.

Canadians have lived exceedingly well during the past few years, and they will not wish to abandon these gains. Indeed, one of the great endeavours of health authorities on all levels of government should be to maintain and extend the gains that have been made.

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★ THE SWIFTLY PACED DEVELOPMENTS of the war have accelerated technological progress not only in industry but also in agriculture, where results have been equally dramatic if less publicized. Advances have been registered in several important lines; in the processing, preservation and packaging of foods; in the cultivation of larger yielding strains and varieties of crops. New methods of disease and insect control are available, and new machines and labor saving devices have been perfected. Better fertilizers and improvements in livestock breeding are noted. Increased interest in nutrition has also improved national standards of living.

—THE INDE



# Notes on Organization

*The statesmanship of the New America exists today, not in the debt merchant or the politician or the gangster, but in that personnel which daily in every walk of life is designing, constructing, and operating the physical equipment of this Continent.*

THOSE readers of this report who are members of Technocracy will know that the organization and operation of the Sections has been a process which has been studied and improved with each passing month. Further improvements will undoubtedly be made, but for the present it is a satisfaction to note the issuance by Technocracy of a pamphlet containing the revised and enlarged **By-Laws and General Regulations**. These will prove a great aid to the Section membership in building up a competent organization and, furthermore, will answer or explain many of the minor questions which heretofore have been addressed to Continental Headquarters.

The statesmanship of the New America exists today across this broad land of ours in the personnel, not of the debt merchant or the politician or the gangster, but in that personnel which daily in every walk of life is designing, constructing, and operating the physical e-

quipment of this Continent.

The foremost specification in the statesmanship of the New America is a knowledge of precision control of all energy-consuming devices. Under the hazardous interference political control of this Price System, technology—drafted into service by the system for the further reduction of physical costs—has developed a methodology of control which is the most sensitive and accurate ever devised by man. It is in use today in every high-tension transmission system and in every high-speed, continuous straight-line production system.

It is the only system that can be extended to give a balanced-load control of all Continental operations. It is the only system that has as its inherent, impersonal objective the satisfaction of the wants of man. It cannot be operated by morons, nor by an undisciplined, unorganized mob, nor by sincere self-seekers wishing to do someone else good for their own betterment.

The balanced-load system of Continental control cannot be bribed or gyped, and personal favoritism doesn't count in its operation: being somebody's son or brother-in-law won't get you anywhere. Personal influence under this

system will be of no use except as an amusing pastime. The success of the individual under such a Continental system will not be gauged by his bank account, his bonds, or the pleasing personality of his Arrow-collar appearance, or his nicety in rendering Emily Post amenities. The success of the individual will be determined solely by his capacity for competent functioning in phase with the balanced-load operation.

Discipline may be defined as that conditioning of an organism, whether consciously or unknowingly acquired, which is prerequisite to any form of behavior other than the simple responses set off by innate instincts. Some degree of discipline is therefore essential to the carrying out of virtually any conceivable human objective.

The unique character of America's present and most probable future physical state has laid down the specifications for social operations which will have to be adopted when the Price System shall have become inoperable. It has been shown that the design of the Organization known as Technocracy Inc. is in turn laid down by the advance requirements of those operating specifications. The problem of applying science to the problems of human society is here undertaken as 'a culmination of the unidirectional progression of all the divisions of science'—physics, chemistry, biophysics, geophysics, astro-physics, electro-mechanics, etc.—'into the science of social phenomena.' Technocracy may correctly be called Social Engineering. Similarly it has been shown that the character of the job in hand specifies certain requirements of conditioning on the part of all

individuals preparing to carry it out, over and above that great range of useful abilities that members by and large already possess.

From this it follows that Technocratic discipline consists of acquiring certain functional capacities. These are, briefly, a degree of proficiency in applying a scientific procedure, in conjunction with appropriate available scientific knowledge, in the solution of problems encountered; the capacity to carry out the work of any one or more of the functions of the Organization as outlined in *By Laws and General Regulations*; and the capacity to function 'in phase' with the functioning of the Organization as a whole—that capacity which is acquired through understanding of the Organization's operating characteristics as well as one's own, as they are found to exist whether considered as a whole or in detail.

In the Introduction to the *Technocracy Study Course* certain 'tools of the mind' are provided and the correct use of language of scientific procedure is indicated. Knowledge is received, recorded, and conveyed only by means of defined terms; and then only in the form of verifiable facts.

A clear idea of the extent to which language is commonly misused may be obtained from Hayakawa's book *Language in Action* (Harcourt Brace & Co.). Many potentially useful words have been rendered, by constant popular misuse, practically useless for any scientific purpose. For example, words like 'dictator,' 'freedom,' 'justice,' 'regimentation' have acquired, through reckless or unscrupulous use, connotations



loaded with emotional prejudice that they are almost useless for any purpose except starting an uproar. It is here turned that the word 'discipline' itself is often misused that it tends to suggest licentious notions of an ironpant's authoritarianism or of grisly punishment.

As the scientific method cannot afford to confuse issues with idle argument, so technocracy does not and by nature cannot indulge in arbitration by personal authority. Decisions arrive from examination of the facts. Such a discipline obviously cannot be enforced by penalty, and in Technocracy 'punitive' discipline does not exist. All Technocrats, however, learn to take orders as well as to give them.

Technocratic discipline, then, is essentially self-discipline. The problem is quite simple; but it should not be inferred from this that such self-imposed discipline is in practice quite easy. Such a conclusion would be merely another misuse of words, for it can be quite difficult.

The *Study Course* itself is a collection of facts, arranged in an orderly manner, and summarized in a scientific manner of laws or tendencies, or projected as statements of probability. Examination of the course should proceed in a spirit of analytical, critical inquiry—a spirit which may be kept alive by constant challenge with the question: 'What has this fact, or series of facts, to do with North America's social problem?' The special significance of the facts is thereby highlighted, and the significant relationships with other facts easily seen—in practice. As this critical approach becomes by constant use a habit of mind,

it will be extended to the student's inquiries into wider fields—the scientific source-books of the *Technocracy Study Course* will be scrutinized carefully and other books, magazines, and newspapers will be analyzed objectively.

Technocracy's findings are presented to the public as known and verifiable facts. In accordance with such a scientific procedure, emotionalization is not indulged in. The situation as it develops provides a grim show—one can rave insanely to Heaven about it, but there is no future in that!

The antics of the prominent supporters of any and all the institutions of scarcity in the face of North America's great emergent need are indeed contemptible; but if the ironic character of the situation is understood, it may be viewed as high comedy. Since we are paying the price, we may as well have the fun! Too, the ironic wisecrack has long been used as a very effective weapon. It produces somewhat the effect of the impact of a snowball upon a shiny silk hat. In this twentieth century does any wearer of a high silk hat deserve to look anything other than ludicrous? Much of our social big-shotitis, our stuffed-shirtism, our idolization of the enterprising individual, is, to use the figure, an idolatry of a spiritual silk hat.

From the outset the fact must be faced that our previous conditioning has been, virtually from the cradle, a subjection to the malpractices, the frustrations, the wishful concepts, the 'vicious virtues,' the noises and the stench, the over-prevalent sexual disharmonies and their resultant emotional disorders, the insecurity, the dead foods ill-prepared and

'made to sell,' the fears and resentments, and their emotional compensations, the superstitions, and the physical privations of this Price System. Whether known or unrecognized, whether approved or condemned, whether idolatrized as ultimate good or anathematized as evil, these factors constitute the disciplines of scarcity. Philip Wylie in his book *Generation of Vipers* (Farrar & Rinehart) lists many types of resulting twists in human behavior rather dramatically, but seems to be only partly aware of the causes and correspondingly vague about the cure: he refers to them as spiritual faults and moral wants, but this is a moralizer's classification of symptoms and not a scientific diagnosis.

Minor emotional aberrations and tantrums are of such common occurrence that they are usually accepted as healthy human behavior, and pass unnoticed. Macpherson Lawrie in his book *Nature Hits Back* (Methuen) states that recognized cases of insanity receive treatment, inadequate though that treatment may be, out of all proportion to the ratio of their collective suffering in the vast sum total of human misery resulting from mental disorder. The great problem is the man on the street and his 'human' incompetence arising from emotional stresses that are unrecognized, usually unseen. Nevertheless the vague fear or anxiety, the unexplained feeling of depression or despondency, the lethargy and fatigue and ennui, of the man or woman in the street, are the mild neurasthenia, the undeveloped prototypes of the plainly recognized insanities of agitation, panic, and desperation without tangible cause, the melancholia, or

the helpless stupor. The fact must be faced that 'the insane are a lot like the rest of us, only more so!' If the social factors that produce continuous emotional strain continue to operate, as in the past, with ever-increasing intensity, they are quite capable of wrecking our nations without any help from future economic or military developments.

The educational processes of the Price System are based upon the reverend disciplinary practices of compulsive pretension, intimidation, and prohibition. The punishment fits the crime so well in fact, that the result is normally an enhancement of the emotional sickness or material want which produced the crime.

The first generation of New America will exhibit behavior patterns profoundly different: their conditioning will be carried out as one of the elements of clean, hard, bright design for living that will be the glory of all the ages.' It is indeed questionable whether or not they shall be able to understand much about these children of ours. Their conditioning would be admirably adapted to carrying out of the task we now undertake—but let us admit that ours is better than it should be!

Let us realize that to function in this phase, to maintain a spirit of cheerful endeavor in the face of frequent cause for discouragement, to get along with people and to tolerate the personal peculiarities of other victims of Price System conditions even as our own are also created, to resolutely refer all questions to the facts involved and to the requirements of the job, to refrain from prevalent malodorous habits of indulgence



opinions, personalities, gossip, loose criticism, and argument, is unlikely to be easy at the outset. But it will come with constant practice.

When these malodorous habits are ingested, the indulgence constitutes sabotage. If the effects upon the carrying out of Technocracy's job are serious, it must be accepted as final evidence that the timing of the habits is thereby rendered fit to be a Technocrat.

It should be stated that the possession of a college degree has often hindered the possessor's progress in understanding Technocracy as much as it has helped. College passmen are steeped in the pervading philosophical atmosphere of intellectual liberalism. To make a flat division—even to know anything for one—is considered crude, coarse, and foolish. It is an attitude of mind which assumes that everything is for the best somehow—that the enunciation of a few philosophical principles by 'thinking' from time to time is enough to guide one's faltering footsteps up the long hill to Utopia. 'Intellectual liberals' have acquired so much erudition that they are only capable of endless deliberation. All they can do is decide not to decide. A background of business success often produces a similar effect.

Technocracy's discipline cannot be obtained in any college or university. It cannot be bought with money, even though Technocracy's activities, like any worthwhile pursuit, do cost money as well as time. Technocracy has no subsidies or endowments; it has been built up by its members with their own resources. Technocracy has accomplished far more for a dollar of investment than any other

organization of human beings past or present. Members have openly stated that the personal development they achieved in Technocracy has been worth many times the cost, even if they never live to see the New America. They should know because their investment of time and money has been above average. This is an education that does not require a college degree or even a high school diploma as prerequisite—it requires only plain citizens of the national entities of North America who are possessed of clean patriotism, loyalty, personal integrity, and a modicum of sense.

The war and the immediate postwar period are inextricably locked together, and Total Conscription is the way to win the war sooner and to preserve internal stability after the war by a system of control that is not in conflict with our technological progress. Then let the people of this Continent decide which way they want to go. Let all Technocrats study the clauses of Total Conscription in the light of the attempts being made by business to revert to the prewar economy. Investigate and use the facts which are published on government-owned plants, new equipment, new capacity, and corporate profits to illustrate the necessity of Total Conscription.

# A Question Answered

**W**HAT is the attitude of Technocracy Inc. toward religion?

Technocracy Inc. is concerned with the transition to the social operation that science has indicated as the next most probable for the people of North America—if most of them are to go on living. As an Organization, therefore, it will never allow itself to be dragged into religious controversy of any kind. It regards the religious beliefs of an individual as sacred to that individual.

In the Organization are persons of every religious denomination working for common objectives—economic security, a higher standard of living, and greater leisure; in effect, for the social mechanism that has been made possible and imperative by the advance of technology.

In the Technate every person will have the opportunity to

really be a Christian. No longer will anyone have to chisel other human beings in order to obtain a livelihood.

This applies to ministers and priests as well. No longer will they be forced to chisel their congregations for a living. Should any sufficient number of people request the services of some individual as their spiritual adviser, he will be released from work in any other Functional Sequence and can devote his time to religious teaching as a member of the Social Service Function while at the same time receiving a consuming power equal to that of anyone else.

Many religious leaders of today see in Technocracy the answer to all that they have worked, hoped, and prayed for—life of security, abundance, leisure, and peace for mankind; society practically free from disease, crime, and ignorance.

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★ CANADA'S NET DEBT today is nearly three times the prewar figure. In 1914 the net debt per capita was \$41; in 1919, \$199; in 1939, \$279; and in March 1944, \$774. Annual interest charge on the funded debt at the end of the last fiscal year was \$274 million, or an average rate of 2.57%, compared with 3.5% in 1939 and 5% in 1919.

--THE ROYAL BANK OF CANADA



# TECHNOCRACY

## HAT?

Technocracy is science in the social field. *Encyclopedia Americana* says: 'Whatever the future of Technocracy, we must fairly say that it is the only program of social and economic construction which is in complete intellectual and technical accord with the age in which we live.'

## HEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Bunde (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that technocracy had been reborn suddenly, full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves into an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## The Strangers

**I**T happened in France the other day. One of the bitterest ironies of our age of war . . . An American soldier—whose father had died in Flanders' fields without ever having seen his infant son—gave his life for the future of an infant son he in turn had never seen.

Three generations of strangers . . . and now what of the third generation? Will this child, too, grow up to inherit all the old lies, the mistakes, the weaknesses that go to make up war?

What is it that his father and his father's father died for?

Already, we're dusting off the solemn aphorisms about not having died in vain, and we'll build a bright new marble cenotaph to his unknown father. But it isn't enough. Brother, it isn't enough!

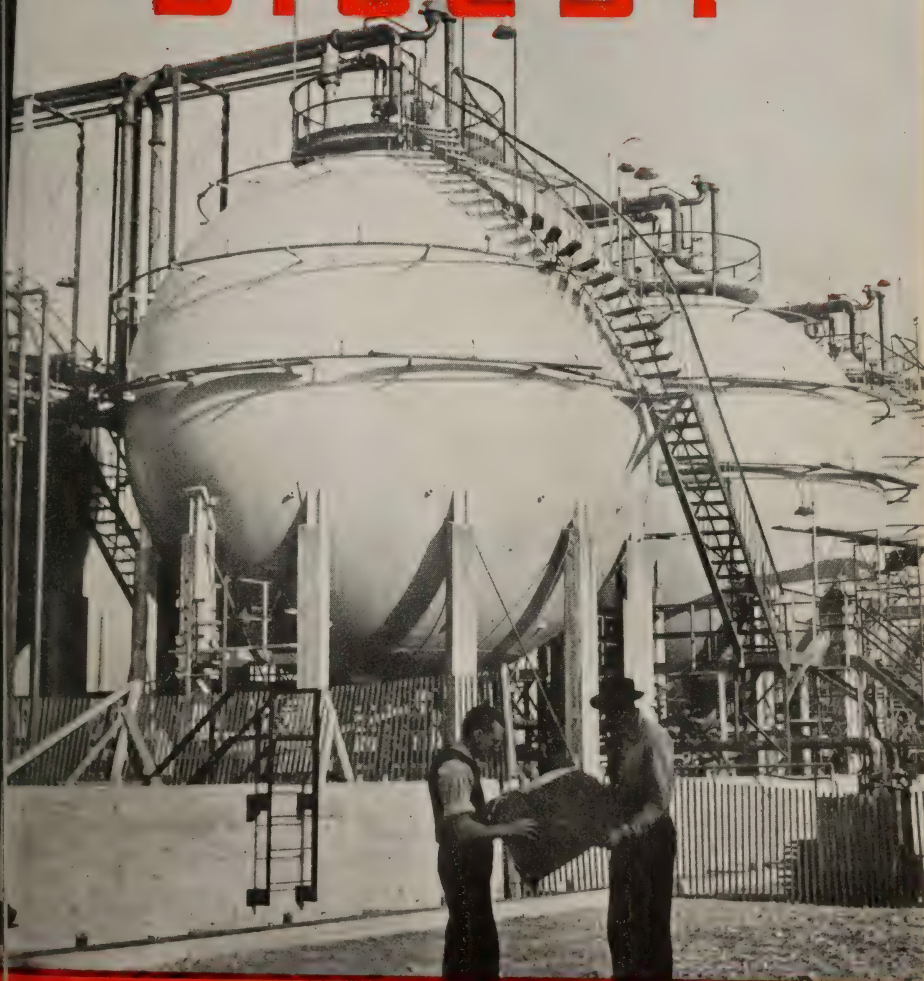
We will emerge from this war the most powerful nation on earth. Our Navy and our Air Forces will be twice the size of all others combined—our manufacturing productivity will equal half the world's total capacity. If we can't enforce peace with that kind of club—and if we can't make jobs building houses for our sons to live in as well as by building tanks for them to die in—then God help us!

—BRYANT CHUCKING GRINDER COMPANY ADVERTISEMENT

(Section Stamp)



# TECHNOCRACY DIGEST



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# TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS  
COUNTRY FOR SOCIAL CHANGE

AUGUST, 1945

VANCOUVER, B.C.

No. 86

## —STAFF—

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## FRONT COVER

The Polymer synthetic rubber plant at Sarnia, Ontario, produces buna-S at an annual rate of 34,000 long tons and butyl at the rate of 4,000 long tons. This is the only plant in the world which not only makes these two kinds of rubber but also makes the three necessary ingredients, styrene, butadiene, and isobutylene.

(NATIONAL FILM BOARD PHOTOGRAPH)



# North Americans Must Face the Facts

*Technocracy points out that only World War II has made it possible for the Price System to survive until now. With World War II coming to an end, we must prepare to meet the greatest social crisis that North America has ever known.*

**T**HIRTEEN years ago—in the fall of 1932—the word ‘Technocracy’ burst upon a depression-stricken world. For a few short months the newspapers and magazines of North America ballyhooed Technocracy as ‘the greatest story since the (first) World War.’

Then, just as abruptly, Technocracy was dropped. Some of its social implications had been realized—so its findings were ridiculed and the press henceforth maintained a conspiracy of silence against it.

Technocracy went quietly and steadily about its work, secure in the knowledge that events would finally force North Americans to face the facts. Today, ironically, the one-time ridiculers of Technocracy are ‘stealing our stuff.’

Technocrats, who through the years have kept at their task of educating the people of this Continent to the social consequences of technology, can now feel satisfaction to see such a sacrosanct

status quo-er as the **Wall Street Journal** printing material that reads like notes from a Technocrat’s case book:

‘The number of machines on farms has increased 50 per cent since the beginning of 1942. These machines more than halve the man-hours needed for this work. Such greatly increased mechanization helps to explain how agricultural production has increased 20 per cent since 1939 despite a sharp decline in farm employment.’

‘... in Colonial times 90 out of every 100 people in this country had to work on farms to grow enough food. Now the ratio is just reversed.’

‘A century ago one man could take care of about five acres of corn; now he can handle a hundred acres. In 1909, it required 12.7 man-hours to grow an acre of wheat; by 1935 this had been halved, and today it’s down to 3.3 man-hours.’

‘... the number of corn pickers

in use has increased 29 per cent during the past three years. One man can harvest as much corn with one of these machines as 10 or 12 can by hand.'

'New machines . . . may revolutionize cotton production. A mechanical cotton picker is now in limited production by International Harvester. It picks in a day about as much cotton as could be harvested by 40 to 50

average hand pickers.'

Remember that Technocracy told you such things back in 1932. Today, Technocracy points out that only World War II has made it possible for the Price System to survive until now. With World War II coming to an end, we must prepare to meet the greatest social crisis that North America has ever known.

—The Editor

## Our Technological Tomorrow

★ WHEN THE WAR ENDS in Europe the agricultural plant of the United States will be geared to produce approximately one-third more than the average production of the pre-war years and with more land, labor, machinery and technology available, the industry's productivity could probably be expanded to at least 50% over the peacetime output within a short term of years, the Department of Agriculture estimates.

Obviously farmers will want to continue producing at high levels. Doubtless they will wish to avoid any return to crop-restriction programs. But many stubborn facts lie in the path of the attainment of such ambitions. Large stockpiles of surplus food exist today. We cannot count on the kind of food export boom such as that which developed after World War I when foodstuffs, in the year 1919, for example, constituted about one-third of our total exports. Military food procurements, now running at the rate of 8 million tons a year would be cut in half when hostilities end in Europe, it is estimated, and our civilian reserves of 5.5 millions tons in England would probably follow a similar contraction.

—THE INDEX

★ A ROTOLACTOR, or cow-milking machine, the first one of which has been in operation in New Jersey since 1930, is soon to be marketed in two sizes, one having twice the capacity of the other. The smaller one which will cost approximately \$50,000 and requires two attendants, milks 25 cows at one time, the whole process taking less than 12 minutes. With this machine, therefore, a herd of 800 can be milked in six and a half hours.

★ NOW IS THE TIME to do some serious thinking about the effect of modern technology on postwar reconstruction. Unless attention is given now to the probable consequences of technological advance, speeded up by the war, we will find ourselves (as usual) sadly debating what should have been done when there was still time to do it, and resorting to wholly inadequate makeshifts. —JOSEPH MINDEL in *Tomorrow*



# The Electron Wants Your Job!

*The electron is your rival in postwar industry—and he's no imaginative bogey. He's here. He may even be doing your prewar job, and doing it with an accuracy and speed that puts your performance to shame.*

**M**ISTER, you really don't amount to much. You now have a rival who can do almost everything better than you can.

Your rival is the electron, who has been harnessed to do better work than you ever did, in a thousand different fields. And he does it more quickly and cheaply. The mechanical man has fingers that feel, eyes that see, a nose that smells, ears that hear, and a brain that in certain respects can outthink you every time.

He's your rival in postwar industry—and he's no imaginative bogey. He's here. He may even be doing your prewar job, and doing it with an accuracy and speed that puts your performance to shame. He's so successful that the industry which makes and installs the mechanical men—electronics—has mushroomed during the war into a six-billion-dollar business. No other indus-

try with peacetime potentialities has experienced such a growth.

The invention of the mechanical man has not yet been felt by the average worker because of the demands of total war production. But in the coming months, we are certain to see the mechanical man invade civilian and consumer industry. Wartime research has already revealed ways in which electronics can take over jobs in almost every field.

For the present, we can only guess what effect this will have on employment. Before we go into this problem, let's consider what electronics is, and what it is doing now.

Electronics is the science that harnesses the electron, a particle so small that it compares to the head of a pin as a bumble bee does to the Empire State building. The electron is harnessed by means of either vacuum or gas-filled tubes. There are five main kinds of these electronic tubes: (1) the radio tube; (2) the photo-

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Reprinted from *MAGAZINE DIGEST*.

tube, or 'electric eye'; (3) the X-ray tube; (4) the television tube; and (5) a group of gas-filled tubes known as thyratrons and ignitrons. These last can conduct large amounts of power, and are able to change alternating current into direct current.

These five main groups come in some 2,000 different shapes and models, each for a different job. One of the simplest applications of electronics is the 'electric eye' which opens a store door automatically at the approach of a customer, turns on a drinking fountain, or sets off a warning signal when a burglar breaks an invisible beam of light by trying to enter a building through an open window.

Other uses for electronics range from automatic assembly-line inspection of the contents inside sealed cans and cartons to calculating the pattern of human brain waves for use in diagnosis.

In industry, electrons have taken on such jobs as fashioning the huge 24 foot diameter propellers for battleships, aircraft carriers, troop transports, and cargo ships. Formerly these big propellers had to be fashioned by hand—a job that took two weeks. Now, with electronics, a propeller

is made in two days—a 700% saving in time. Electrons control a tracer that automatically guides two sharp steel-cutting tools over the surface of the propellers, cutting both sides of the propeller at once. The cutting tools are controlled in such a way that they shape the propeller to the exact proportions of a small wood or plaster model, one-fifth the size of the actual propeller blade. The finished blades are turned out with an accuracy of one one-hundredth of an inch of the correct contour.

Then there is the electronic sewing machine. By using radio-frequency current instead of ordinary needle and thread, it stitches a thin solid seam in fabrics that have been coated with a special thermoplastic material; the bond so created is as strong as the plastic itself.

The same principle is used in electronic control of spot welding to join two pieces of metal together quickly and precisely. This method will ultimately replace riveting in airplane construction.

When it comes to accuracy of the eye, man isn't in it with the electron. A new device called a spectrophotometer can distin-



uish 2,000,000 tints, while a good artist can discern only 10,000. This machine, eliminating guesswork in matching colors, is valuable in the dyeing of fabrics, guaranteeing that each dye bath is the exact tint wanted.

Electronic machines today are used in tobacco factories to detect imperfect ten-cent cigars which are sold as 'five centers.' In canneries they sort out off-color or spoiled peas, beans, oranges, and other vegetables and fruits. In strip mill, photo tubes are used to detect pinholes in the steel. They control the thickness of steel with an accuracy of which man is incapable.

X-rays peer into metal castings, to discover defects that can't be found by any other means.

Di-electric heating, by which it is possible to heat an object from the inside out, is used in gluing plywood together, and in molding plastics. In medicine, it helps to induce artificial fever for treatment of sinus trouble, venereal disease, arthritis, and other ailments.

Electronic devices are being used to dehydrate milk. Mechanical means of dehydration leave in 2% of the water. Electronics can cut this water content

in half and thus make it possible for dried milk to withstand even tropical heat.

Another electronic creation is supersonic waves—or sound waves of such a high pitch that they cannot be heard by humans. These vibrations are used in killing certain forms of bacteria, in processing liquid materials, in making better homogenized milk, and in speeding up the usual ageing process of wines.

To accelerate the wartime output of aluminum, industry turned to electronics for the large-scale conversion of alternating current to direct current. An electronic device, with no moving parts, replaced a costly motor-generator, resulting in an \$800 saving in power cost for a 300-kilowatt unit.

The mechanical man can taste, too, and is being used to assure uniformity of flavor in food products. He demonstrates his brain power in lightning calculating machines that never make a mistake.

In farming, supersonic waves are being used to treat seeds and stimulate plant growth. The chromosome make-up of seeds is rearranged by X-rays, to create entirely new varieties. And Dr.

Irving Langmuir, a General Electric scientist, says it should be possible by the use of electronics to have an orchard operated entirely without workers. An adaptation of the electric eye and the techniques of television should, he says, 'make possible the construction of a machine that will scan the green tree, locate the red or orange colored fruit and direct electrically-operated mechanical arms to pick it from the branches, sort it according to size and quality, and convey it to the containers. The machine could be set to collect only fruit of any desired degree of ripeness.'

Electronic devices are revolutionizing the mining prospector's technique. Each mineral responds differently to selected frequencies of ultra-violet light. The geophone, a metal locator, tells him if metal is near the surface. And he can map the geological formation of the territory by means of sound waves transmitted into the earth, from the timing and degree of reflections of which the various strata are calibrated.

In medicine, electronics is used in measuring 'brain waves,' or minute electric currents emitted

by the brain. Such readings help doctors in diagnosing epilepsy, tumors of the brain, and similar disorders. Recently an electronic finger was used in New York to remove a two-and-a-half inch sewing needle from a woman's heart.

The electron microscope is opening up a whole new field to science. Ordinary optical microscopes are able to magnify an object only 2,500 diameters. But with the electron microscope it is possible to magnify up to 100,000 times. For the first time, man has been able to see and photograph a molecule. And he can study minute bodies in viruses which were hitherto invisible.

Postwar aviation will, of course make use of radar, which is still one of the war's more-or-less secret electronic devices. Flight control is already being handled over electronic radio beams. And by electronics, robot balloons assemble weather readings and transmit them to forecasters on the ground.

Yes, electronics will make life easier and simpler in many ways. But there is no getting around the fact that the electronic man will compete for many jobs now being done by human workers. The



nature of the threat is shown by his example: machines that do precision grooving, now operated by skilled workers, can be converted to automatic electronic control for 10% more cost—and will then turn out 67% more work than a human operator can.

The engineer, rightly enough, feels that the human repercussions of electronics are not his worry. They are the worry of the economist and the planner.

Science has given man an instrument that can give us shorter working hours, more leisure, and more things to buy at a much lower cost.

Or, if misused, the robot can oust the human worker from his job, setting in motion an infinitely more vicious cycle of unemployment than we have yet seen. The social effect of discoveries depends on how they are used.

—Matt Bartley Smith

**EDITOR'S NOTE:** *The 'human repercussions of electronics' (and every other technological advance) must become the 'worry of the engineer.' Technocracy states unequivocally that the march of events will soon force the scientists, technologists, and engineers of North America to assume responsibility for production and distribution.*

## Men and Machines

✧ A REVOLUTIONARY DRILL which will dig holes for telegraph poles or fence posts in less than 3 minutes has been introduced in Canada by the Canadian National Telegraphs and is now in use along the company's lines, it is announced by A.P. Linnell, general superintendent, western region. The new equipment saves about one hour's time per post compared with that required by hand digging in average ground and up to 7 and 8 hours through frost and hard pan.

The drill is installed on the back of a standard D-2 Caterpillar tractor and will dig to a depth of 7 feet. Extensions can be obtained up to depth of 10 feet. It also has a changeable auger and will dig a hole up to 24 inches in width. The C. N. Telegraphs are presently using 16-inch and 20-inch augers. The drill will dig a hole at almost any angle.

As previously used in parts of the United States, the drill has been mounted on a trailer, but the C. N. Telegraph engineers found that a tractor is more practical as it allows the drill to be moved rapidly over almost any type of ground.

—VANCOUVER NEWS HERALD

✧ EVERY CITIZEN MUST BE MADE to realize that the technological status of society cannot be left to the haphazard workings of erratic, indeterminable forces, but must be the result of intelligent planning. It is useless to lament the evils of modern science. The job ahead of us is to devise scientific controls that will eradicate these evils, that will enable us boldly to exploit the tremendous power of the machine for the social good.

—JOSEPH MINDEL in *Tomorrow*

# Big Business Shows Its Hand

*Big Business proposes that the billions of dollars worth of plants that private enterprise was unable, or unwilling, to build for the war effort shall revert at the earliest possible moment to private control—or be closed or torn down.*

WASHINGTON.—Cloaked in fine phrases of 'protecting private enterprise' and defending the 'American Way of Life,' history's greatest bilking of a Nation's population is building to a crisis here as bidders scan the Government's \$16,000,000,000 holding of war plants for choice morsels.

Pattern for the great deception has been neatly laid before the Senate Small Business Committee by a parade of distinguished and reputable businessmen.

Its keystone is 'get the Government out of business.'

These businessmen have no intention of stealing the Government plants. They all argue for payment of a 'fair' price. Their intentions are 10% honest—within the code of competitive enterprise as they have known it.

They propose that these billions of dollars worth of plants that private industry was unable, or unwilling, to build for the war effort shall revert at the earliest

possible moment to private control—or be closed or torn down.

These are not interpretations but direct statements of distinguished men of business who have been telling Sen. James E. Murray (D., Mont.) and the Small Business Committee what to expect in the line of 60,000 new businesses in the aluminum and magnesium fields after the war.

The businessmen are also perfectly honest in the position that they want those now operating the Government plants to have first chance at getting them.

The 11,000,000 men now in military service would get, at best, second choice since they do not have the 'experience, the knowhow and the background of operation.'

The little businessman who was frozen out of war contract would, likewise, be sidetracked.

Entirely excluded are the workmen who have turned the wheels of these plants during the war and bought bonds and paid



taxes to make their construction possible.

The committee has heard so much emphasis on the factor of employment and the necessity of turning the war plants over to peacetime production for the purpose of supplying jobs that some of its members must have begun to wonder if the profit motive of industry had been forgotten.

Among the frankest witnesses before the committee were E.E. Wilson, president of the Aeronautical Chamber of Commerce of America, and Henry J. Kaiser.

'With regard to plant disposal policies,' Wilson said, 'this industry can only assert that in gener-

al it feels that disposal of Government-owned aluminum and magnesium plants should be handled similarly to the disposal of steel, shipbuilding or aircraft plants.

'The guiding principles should be the safeguarding of free private enterprise, the encouragement of competition and the avoidance of subsidy or Government operation.'

Kaiser, the 'miracle man,' was the most fulsome witness on the employment angle of reconverting war plants. He insisted as vehemently as other witnesses that Government must turn all the war plants over to private industry. —Milton Murray in PM

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★ THE CHINESE were the first to discover a practical method of paper making by the weaving of fibres. They made paper first on coarsely woven cloth moulds and later with moulds of thin, parallel bamboo strips, held in place by silk threads. The Arabs of Samarkand acquired the art from the Chinese, and they were followed by the Persians. The Moors introduced it into Europe in the 12th century via Spain, whence it was carried to Italy, France, the Netherlands and Germany. Paper making was begun in England in 1492, but apparently died out until reintroduced nearly a hundred years later. It did not become firmly established there, however, until closing years of the 17th century. The production of paper in Canada dates from 1803. In 1917, when accurate statistics of paper production were compiled for the first time, the output totalled 856,000 tons. In 1943, the production was almost five times that figure.

—DOMINION BUREAU OF STATISTICS

★ THE OUTPUT OF ELECTRICITY from central stations in Canada during the first four months of 1945 increased from 13,619,125,000 kilowatt hours to 13,667,586,000, there being a gain in April from 3,277,198,000 to 3,534,157,000 kilowatt hours, making a new record on a daily basis. The gain was in secondary power, which rose from 263,911,000 to 668,666,000 kilowatt hours.

—BANK OF MONTREAL

# Casualties on the Home Front

*With the advent of Total Conscription, women will receive an income equal to that of men. Persons who found their married life intolerable could thus go their separate ways without fear of economic repercussions.*

WHILE thousands of young Canadian lives have been snuffed out on foreign battlefronts in this global total war, tragic casualties have also inflicted on the domestic life of the home front. Having their roots frequently in the trouble-rich soil of an insecure prewar period, many marriages are cracking up under the added social strains which are being presently imposed upon them. Under wartime economic disturbances they are snapping, thereby dealing a heavy blow to the home, which is generally conceded to be the principal bastion of national solidarity.

Marital upsets fall into three general classes—divorces, legal separations and desertions. The first two we shall pass over as they are in the great minority, although in this connection it might be mentioned in passing that British Columbia has the dubious honor of leading the Dominion in the complete absolu-

tion of marriages. The third, desertions, we shall give some consideration as it is a problem which has increased to sufficiently great proportions to warrant special attention by our law courts.

What happens, when, in the latter case, a man deserts his wife and leaves her to shift for herself? In Vancouver, the answer to that is found in the recent establishment of a Family Court the sole purpose of which is to investigate desertions, non-support cases and other family troubles, and to arrive at solutions thereto. Previously, these cases were handled in the regular Police Court, but the continual increase in their number necessitated the creation of the special court on March 1, 1945. As this venture is still somewhat in the experimental stage, it will be more efficacious to consider the procedure prior to the transfer.

When a woman's husband deserts her, she would go to the



City Prosecutor's office where the particulars of her case were regarded. If considered worthy, a summons under the provincial Deserted Wives' Maintenance Act was issued against the husband ordering him to appear in court to give reason why he should not support his wife. If the case were decided against him, the presiding magistrate ordered him to pay to his wife a proportion of his salary each week.

The more conscientious husbands usually abided by the magistrate's decisions and came through with the stipulated amount, but others who were not so inclined proved difficult. Non-payment resulted in further summons to court to explain the failure, and if too flagrant instances arose, the errant spouse was incarcerated for not obeying the court order. This, however, availed the wife little materially, except that she became a civic ward during the term of her husband's imprisonment, and, by being a social burden, ensured herself of a measure of subsistence.

Just how far the new Family Court will be successful in meeting its requirements is a matter to which only time can give the

answer. It is, like the Police Court before, dependent upon the indulgence and conscientiousness of men already poorly disposed toward their wives for the success of its idealistic enterprise.

The crux of the matter is that unless a man voluntarily supports his wife or abides conscientiously by a court order, there is not a great deal that can be done about it. If he is sufficiently opposed to payment, the threat of jail will not greatly worry him, and, as already intimated, his imprisonment will not benefit his wife.

Actually, if two married persons for any cause whatsoever find they cannot live together, there is no reason why there should be any restraining bonds to keep them from absolute mutual freedom. A man should not be required to support a woman for whom he no longer holds regard; and a woman should not have to rely on such a one for the provision of her economic requirements. Separate and like incomes obviate the necessity of any interdependence between the estranged couple.

Under Technocracy's Victory Program of Total Conscription, such separate incomes would be forthcoming to all persons. This

program—the Total Conscription of Men, Machines, Materiel and Money with National Service from All and Profits to None—would place all persons in the same category of pay and service as the men in the Armed Forces. Besides the provisions of rent-free living quarters as well as free food, clothing and medical care, every person would receive payment which in no case would be less than that received by a private in the Army, and it would be free of all encumbrances such as taxes, insurance or bond reductions. These benefits, which far exceed those the average person receives under present haphazard controls, would be the assumed responsibilities of the Government in order to release all persons from economic worry so they might devote their whole energies to the one big job of bringing the war to an early conclusion.

It is obvious what an effect such a program would have on the problem under discussion. Persons who found their married life intolerable could go their separate ways without fear of economic repercussions. If there were children, they would receive every benefit available, and would only be turned over by the Government to either of the parents upon the sufficient knowledge of their ability to train the children competently.

Incidentally, since the cause of most such trouble is economic insecurity and this cause would be removed by Total Conscription it is axiomatic that a major cause of domestic disquietude would be thus abolished. The need for a Family Court would also be eliminated, making possible a serenity and tranquillity which is rare in present day marriages.

—Rupert N. Urquhart

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★ MORE THAN TWO MILLION TRACTORS today are helping American farmers plow, harrow, plant and otherwise ease the job of raising crops. That is a record number—12.4% more than at the end of 1941 and double the 1929 total.

There has been an even more rapid growth, however, in machines that offer the biggest labor savings. Thus the number of corn pickers in use has increased 29% during the past three years.

One man can harvest as much corn with one of these machines as 10 or 12 men can by hand. Last year International Harvester, largest company in the farm equipment field, produced twice as many corn pickers as in any previous year.

—WALL STREET JOURNAL



# Canada's Northland

*The Land of the Midnight Sun awaits the Technate of the New America. When it comes, the so-called Barren Lands will fade into myth and legend, to be replaced by the great industrial north that will take its part in making this Continent the birthplace of a new race.*

—TECHNOCRACY MAGAZINE

**T**HIS letter tells what men are doing in making a living and building a civilization in Canada's Northland beyond the rim of dense population, but it is first of all necessary to decide what is North, and how much of the Dominion is to be treated as lying within its bounds. The Montrealer who visits the Laurentians, 50 miles away, is going north; to the Edmontonian, the Peace River is north, and at Ak-lavik, 2,200 miles by river from Edmonton, one is only half-way between Canada's southern and northern limits. There is nothing absolute about 'north.' Arctic exploration started with a Greek navigator who left Marseilles in 33 B. C. to discover the British Isles. Since then men have continued to push into ever higher latitudes, and wherever they settle becomes the beginning of 'north.' As a matter of fact, not so much of Canada is 'north' as

is commonly supposed. Even the most southerly part of England is in latitude 500 miles north of Toronto, and London is north of Winnipeg.

Among foremost enthusiasts for Canada's Northland is Dr. Charles Camsell, Deputy Minister of Mines and Resources and Commissioner of the Northwest Territories. Dr. Camsell was born in the Mackenzie District, the son of a Hudson's Bay Company factor, and has spent the greater part of his life in exploration, his research in the North having won him many honours. In his presidential address to the Canadian Geographical Society in 1939, dealing with Yellowknife developments, Dr. Camsell said: 'In spite of the idea prevalent in certain quarters that residents of the Northwest Territories are "God's frozen people" there is nothing in the climate of that region to prevent people carrying on the same activities all the year round as they do in the City of Ottawa.'

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Reprinted from ROYAL BANK BULLETIN.

In fact, Canada's Northland is no more inhospitable in these days than Nova Scotia and New Brunswick were to the British Empire Loyalists who moved up from the thirteen colonies around 1783.

Canada's Northland is a big country, sparsely populated. It slopes toward the Arctic Ocean, which explains why travellers speak of going 'down' north. Including only what is officially designated the Northwest, there are, 1,500,000 square miles with a population of 17,000, of whom 5,000 persons inhabit the quarter-million square miles of the Yukon. In peace time Fort Smith had about 250 persons, while Leningrad, in the same latitude, had 2½ million. But Leningrad is an ancient city, whereas Canada's Northwest is the most recently explored part of this continent, and is just on the threshold of development.

Canada's north can be divided into Northwest Territories, Yukon, New Quebec and the Hudson Bay district. The N.W.T. include the mainland of Canada and the Arctic islands lying north of the Prairie provinces and east of the Yukon, with an area about two-fifths of the total area of the Dominion. Westward lies the

Yukon, for nearly half a century known as one of the world's great gold-producing centres and inspiration of poets and authors. Recent developments, growing out of defence measures and the extension of transportation, promise to open a new era in its development. Ontario extends from the latitude of Rome to that of Moscow. Between Georgian Bay and Hudson Bay it bears rich forest, gradually sloping off to mournful muskeg. Underneath are Precambrian rocks, the oldest known to science, containing startling possibilities in mineral wealth. To the east of Hudson Bay lies New Quebec, formerly Ungava. The ice age seems to have passed this way only yesterday, and nature has not had time to finish building the Laurentian world. There are great water-courses, along whose banks the rock has not yet been ground into soil, and inland there are thousands of acres of muskeg which has not had time to develop into earth. Much of this potentially-rich territory has still to be explored, but minerals of economic value have been discovered at accessible points. South of it, the Abitibi region, between the 48th and 49th parallels, has good



quality soils which attracted colonists as far back as 1912, and in 1941 it supported 67,000 settlers. The Department of Colonization believes there is room for 200 new parishes of 200 families each.

Exaggerated ideas of the harshness of a country's climate are given by absence of the shelter and company to which civilization has accustomed people, but those used to the north boast of its clear skies, and the light of the aurora borealis which is sufficient, even in the depths of the northern night, for necessary outdoor occupations.

There is a marked distinction between the climates of the Eastern and Western Arctic regions. Along the Arctic circle the average July temperature ranges from 42 degrees in southern Baffin Island to about 60 degrees on the lower Mackenzie. Some agriculture is possible in the Mackenzie Valley, whereas in corresponding latitudes in the eastern Arctic there is only tundra. No place of record in Canada's Northland, however, can match Yakutsk, Siberia, the cold pole of the world, where there is a population equal to one person in every four square miles, as compared with one person per

hundred square miles in Canada's Northwest.

Native inhabitants of the Canadian North are the Eskimos, who have made a living with primitive weapons and implements along the Arctic coast from the Yukon-Alaska boundary eastward. They are honest, intelligent, hard-working people, and Canada is trying to organize affairs in the Northland so that these aborigines and the intrusive white man alike may prosper. Their numbers have increased during the decade between censuses from 6,000 to 7,200, of whom about 1,600 are in Quebec.

Many people are curious about the plant life of the North, particularly when they learn that ossified remains prove that great forests once grew in the very shadow of the Pole. In some regions of the Northland today vegetation is dense, and in many places there is a bewildering abundance of wild life. One writer says there are 750 species of flowering plants and ferns west of Hudson Bay. Mrs. George Black tells in her biography of assembling 464 varieties of native wild flowers in the Yukon, which 'did much to disperse the too-

prevalent idea that the Yukon is a barren, frozen land.' The 'barren lands' are bare of trees not so much because of very cold temperatures as from lack of moisture. Trees eighteen inches in diameter grow 150 miles north of the Arctic Circle at the Mackenzie delta, but at Hudson Bay the line does not run much beyond Churchill. The Mackenzie forests are chiefly valuable as the source of local building and fuel material, and, so far as is known, there is no timber suitable for exploitation on a commercial scale. Owing to the sluggish growth natural under northern circumstances, trees are replaced very slowly, but authorities hope that with reasonable protection a perpetuated supply may be assured residents.

Merely to tabulate the ascertained and potential mineral wealth of the Northland and near-north would fill a page of this letter. Ironically, disaster and mishap have done more to open up Canada's Northland than have purely exploratory expeditions. The Franklin catastrophe gave the impetus to more than forty search parties during the time when there was still hope of finding survivors, and many others

followed in search of a solution of the mystery. Many pages of the report by the late Major L.T. Burwash on his expeditions of 1925 to 1930 are given to information and photos regarding Franklin records, but the rest of the account deals with wild life, mineral deposits, natural resources, climate, travel, and the Eskimos. Similarly the disappearance of a Toronto mining man in an airplane in 1929 caused a fine-combing of the Arctic which extended polar flying knowledge, drew attention to the mineral resources of the far North, and increased public awareness of the developmental possibilities in the area beyond the railway lines.

While no metallic deposits of note are known to exist in the Peace River district east of the Rockies, natural wealth of other kinds begins right at the gateway to the Mackenzie River basin. Here are found 200-foot-thick beds estimated to contain at least 30 million tons of salt. Here, too, are tar sands, coal, gas and gypsum. East of Fort Norman, on the shore of Great Bear Lake, are the pitchblend deposits from which radium is obtained. Here these deposits were uncovered.

*(Continued on Page Thirty-five)*



OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN

AUGUST, 1945

Compiled By Editorial Staff

No. 31

## *The Story of Canadian Chemicals*

INFORMATION regarding the beginning of the chemical manufacturing industry in Canada is very sketchy. The output of the chemical factories in 1890 was valued at slightly more than \$2 million, but it seems certain that this included some allied products as well as basic chemicals. The industry at that time was very small—a sulphuric acid plant had begun operations a few years previously, the manufacture of methyl alcohol by the destructive distillation of wood had been started, some nitroglycerine was being made for use in explosives, and some ethyl alcohol was being produced. The next decade, however, saw the start of the electro-chemical industry with the building of a carbide plant at Niagara Falls, and phosphorus works at Buckingham, Quebec.

From the turn of the century to the outbreak of the First Great War there was continued expansion featuring the opening of large works to make carbide at Shawinigan Falls, Quebec, cyanamide at Niagara Falls, Ontario, and electrolytic caustic soda at Windsor, Ontario. With the war of 1914-18, there came heavy responsibilities to manufacture special chemicals for munition purposes and a considerable number of new plants and extensions were erected. Some

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of these developments were essentially for war needs, such as the manufacturing of trinitrotoluene, cordite, etc., and were discontinued soon after the armistice, but others were of a fundamental nature and remained as part of the permanent industry. Outstanding among the latter was the synthetic acetic acid and acetone plant at Shawinigan Falls, Quebec.

The period between the wars was characterized by a steady overall advance in both volume and diversity of products, including such outstanding developments as the manufacture of soda ash at Amherstburg, Ontario, and of sulphuric acid from waste smelter gases at Copper Cliff, Ontario, and at Trail, B.C. In this period there was also consolidation within the industry through the merger of smaller units into large concerns. There was remarkable progress also in technical skill, in research, and in the training of personnel. When the present war began, the industry was well fitted in these essentials to undertake the heavy responsibilities that were to be placed upon it.

In the current transformation of Canadian chemical industry for war production, probably no aspect has been more important than the explosives and chemicals program. Before the outbreak of hostilities the explosives industry in this country was occupied almost entirely in meeting ordinary commercial requirements, and consequently the chemical industry lacked facilities to feed a large-scale munitions plant.

In October, 1939, under the Defence Purchasing Board, the future Chemicals and Explosives Branch of the Department of Munitions and Supply was set up to expand explosives production and to place the chemical industry on a parallel course of development. Since that time in every part of the country great plants have mushroomed up. Almost three score separate projects, involving expenditures of more than \$160 million, have been undertaken, some being only extensions and others entirely new works, some for explosives, some for shell filling, some for grenades, fuse powders and pyrotechnics, but about half for special chemicals required in the overall program.

It is estimated that the production of chemicals in Canada is



expanded three-fold since the beginning of the war to reach a total value of about \$110 millions in 1943. Today the industry stands as one of the nation's leading activities. It now supplies about 70% of the country's chemical needs, and in addition makes a substantial contribution to export trade. It has buildings and capital equipment valued at \$120 millions, employs 10,000 people, and distributes annually \$18 millions for salaries and wages and \$40 millions for materials, fuel and power. It includes some of the largest industrial establishments in the Dominion. This field of manufacture is dominated by a few major producers, with two score or so smaller firms completing the list.

The alkalis division of the Canadian chemical industry is based upon the salt deposits of southwestern Ontario. Underlying the Windsor-Sarnia district is a salt bed of vast extent. The approximate area of this basin is about 3,000 square miles, and the bed at points is 230 feet thick, at which average thickness a block of one square mile would contain 400 million tons of salt. The salt is brought to the surface as brine, of which about half is evaporated to produce ordinary salt, while half is used for chemical purposes.

At Windsor, brine is treated electrolytically to produce caustic soda and liquid chlorine. Built in 1912 and operated continuously since that date, this works added in 1930 an extension to utilize the hydrogen, which formerly went to waste, in the manufacture of ammonia, this being the first synthetic unit in Canada. Other lines have been added from time to time, including bleaching powder, ferric chloride, sulphur monochloride, sulphur dichloride, and sodium hypochlorite.

To meet the demand of the expanding pulp, rayon and cellophane industries in Eastern Canada, a caustic-chlorine plant was erected in 1934, at Cornwall, Ont. In 1938 another was opened at Shawinigan Falls, Que. For these projects the salt is brought by boat from Windsor, the raw material in this instance being transported to the source of cheap power and to the principal markets for the finished products.

Another important plant using salt brine as its chief material is operated at Amherstburg, Ont. Built in 1919, it is the country's

only producer of soda ash and also, since 1934, of calcium chloride, which is recovered as a secondary product in the Solvay process.

While these alkali producers are presently working to capacity and in some instances have extended their facilities since the war, there were substantial imports under these headings in 1943, amounting to 5,798 tons valued at \$256,348 for caustic soda and 70,557 tons valued at \$1,213,818 for soda ash.

In the acids division of the chemical industry, Canada has long been self-sufficient in regard to inorganic acids, but has been very largely dependent on foreign sources for her supply of organic acids. One of the earliest sulphuric acid plants was at Capelton, Que., at which location there was a considerable supply of pyrites from nearby mines. Built in 1885, it operated steadily until 1925 when it was dismantled.

The first unit using the contact process was built in 1908 at Sulphide, Ont., with pyrites as the chief source of sulphur, and the first plant to utilize smelter gases was established at Coniston, Ont. in 1927. Three new plants have been built since the outbreak of the war to make ten producers in all. Output of sulphuric acid in 1943 totalled 621,435 tons as compared with the highest pre-war tonnage of 282,716 in 1937.

The successful recovery of sulphuric acid from smelter gases has been one of the outstanding developments of the industry. Previously the raw materials for its manufacture were either sulphur or sulphur-bearing ores and, with the exhaustion of the latter, more dependence was placed on elemental sulphur imported chiefly from Texas.

In the search for a cheaper source of sulphur, attention was turned to the sulphur gases which belched from the stacks of Canada's huge metal smelters. In 1927 a test plant was built at Coniston, Ont. in connection with the nickel smelter at that point, and it proved highly successful. In 1930 a larger and permanent unit was established at the smelter at Copper Cliff, Ont.

Even more striking were the developments arising out of the utilization of the gases from the lead-zinc smelter at Trail, B. C. For some time the operation of this plant had occasioned claims for



damages done by the sulphur-bearing gases to crops on nearby lands, and this problem assumed international proportions when complaints came from across the border.

This condition of affairs and the desire to eliminate waste led to an extensive program of research which culminated in the building of one of the largest chemical plants in the country. It was decided to use the waste gases to make sulphuric acid, which in turn could be used to make ammonium-sulphate for fertilizer purposes.

At this point there is now the largest acid plant in the country, a huge synthetic ammonia plant, an ammonium sulphate plant, a phosphoric acid plant, and an ammonium phosphate plant. The final products are the nitrogen-bearing fertilizers, ammonium sulphate and ammonium phosphate, which are chiefly for export. Since 1934 elemental sulphur has been recovered also by means of a new process, this being Canada's only source of pure sulphur. Unfortunately, it is far distant from the large users in Eastern Canada and is shipped chiefly to consumers in British Columbia or the Western United States.

Nitric acid is made at Sulphide and Welland, Ont., and at several explosives plants at other points; muriatic acid in plants at Hamilton and Cornwall; cresylic acid at Toronto; phosphoric acid at Buckingham, Que.; stearic acid and lactic acid at Toronto; and oxalic acid at Hamilton, the last-mentioned being a very recent development.

Glacial acetic acid is made at Shawinigan Falls, Que., in one of the great chemical plants of the Empire. As early as 1903 the power development at this point had attracted a carbide plant which has continued to operate ever since. But during the war of 1914-18 it was greatly expanded. The Allies were then in urgent need of acetone for T.N.T. and later for acetic acid for the manufacture of cellulose acetate, an essential compound for the treatment of aeroplane wings.

A process was worked out by Canadian chemists by which these chemicals could be made synthetically from calcium carbide, and in 1916, at the request of the British Government, the capacity of the carbide furnaces was enlarged, and a large chemical plant was erected. At the close of the war the demand for acetone ceased, and the

company soon discontinued its manufacture, but improvements in its process for making acetic acid and an increasing demand enabled the company to expand its output and ship to markets in all parts of the world.

Continuous research has led to the commercial production at this plant of many acetylene derivatives, including butyl acetate, ethyl acetate, acetylene black, acetic anhydride, pentasol acetate, vinyl acetate, vinyl acetate synthetic resins, dibutyl phthalate, and butyl alcohol. It is interesting to note that production of acetone was begun in 1936 by an entirely new process. In normal times this company is a large exporter, particularly of carbide, acetic acid, acetylene black, and vinyl resins.

In 1943 Canada's exports of acids, chiefly acetic and sulphuric, were valued at \$2,519,000. Imports were valued at \$4,328,900, with tartaric, acetic, citric, salicylic, boracic, and stearic acids as the principal items.

Still other works in Canada are concerned chiefly with the manufacture of chemicals other than acids or alkalis. At Niagara Falls, Ont., there is the largest cyanamide plant in the world. Started in 1909 with an initial capacity of 5,000 tons annually, subsequent additions and improvements had brought the pre-war capacity to 355,000 tons. This tremendous tonnage is obtained through the operation of what was at that time the largest lime-burning plant in the world, the largest carbide furnaces and the largest liquid air plant for the preparation of pure nitrogen.

The calcium cyanamide, which is made by absorbing nitrogen in calcium carbide at white heat, is used chiefly as a fertilizer, and most of the production is exported. A large portion of the output however, is used to make cyanide for use by the Canadian mining industry or for export. Sodium silicate has been produced by this company since 1932.

Phosphorus, phosphate chemicals and chlorates are made at Buckingham, Que., the plant there being the sole producer of these items in Canada. Established in 1897 to utilize the phosphate ores in the vicinity, it has been operating for some years mainly on imported rock. Phosphorus and phosphoric acid were the main products for



most of this period, but in the past decade the company has gradually developed a very diversified line of chemicals including monosodium phosphate, disodium phosphate, trisodium phosphate, calcium phosphide, sodium acid, pyrosodium phosphate, barium chlorate, ammonium chlorate, sodium chlorate, potassium chlorate, and potassium perchlorate.

There is another important works in the general chemical field at Hamilton. Besides sulphuric acid, this plant produces Glauber's salts, salt cake, anhydrous sodium sulphate, sodium metabisulphite, sodium thiosulphite, liquid sulphur dioxide, ammonium chloride, and zinc chloride.

Ammonia and its compounds have been in heavy demand for war uses, and facilities for increased capacity have involved major expenditures in the last few years. At the outbreak of war, synthetic ammonia was being made at Trail, B. C., for use in nitrogen fertilizers, and at Windsor, Ont., for the manufacture of blasting explosives, and some aqua ammonia was recovered from gas liquor at a plant at Toronto.

War requirements brought expansion of the Trail facilities as well as a new government-owned unit at that point, a new plant at Calgary, Alta., operated on behalf of the Government, and a new works near Welland, Ont., also built for the Government but operated by a private company. The Calgary works is unique in that it uses natural gas as its primary material; at Welland the coke process is used. All these plants make anhydrous ammonia and ammonium nitrate.

In 1943 when war demands slackened and a shortage of fertilizer developed in the United States and Canada, steps were taken to utilize the excess ammonium nitrate capacity to provide a material suitable for fertilizer use. This was made possible by a research program which resulted in the making of a prilled or pebbled form of ammonium nitrate, properly conditioned to render it free flowing when used. A large tonnage of the nitrate was exported to the United States in 1943.

—Dominion Bureau of Statistics

# *The Science of Silicones*

ONE of the new scientific developments which are widening the use of electrical power was outlined in Toronto recently by R. W. Kolderman of Dow Corning Corp., Midland, Mich. Fore-shadowed were major changes in design of electric motors, and important new developments in power use.

Behind these expectations lies the recently developed group of chemical materials known as 'silicones,' whose commercial uses are now being actively explored by industrial firms in Canada and the United States.

Here are some of the things that are being claimed for the new materials according to Dow Corning:

Traction motors with theoretical service life of 400 years;

Reduction of 50% in size and weight of motors necessary to deliver a given horsepower;

Motors that will start when wet;

Water-repellent coatings for high frequency transformers, drastically reducing power loss;

Coatings for tableware and textiles that will make a completely waterproof surface;

Lubricating oils that will remain stable at very high and very low temperatures.

Silicones, an entirely new class of material, are derived from sand, brine, coal and oil. Most important property is heat resistance to temperatures up to more than 500 deg. F.; plus water resistance, resilience, and a high degree of stability. They might loosely be described as a cross between glass and organic plastics, combining the flexibility and versatility of plastics with the stability of glass.

Also a cross between chemicals and glass is the first firm to make silicones for sale: Dow Corning Corp., formed in 1943 by Dow Chemical and Corning Glass to make and sell the products their research had developed. Under the stimulus of U.S. Navy interest in many of the products, a new plant has been built in Midland.



Mich., and will shortly begin operations, **The Financial Post** is informed.

Dow Corning's present silicone products appear in four major forms. First to be developed (1941) was DC 993, a varnish with an exceptional heat stability.

Electric motor designers, formerly hampered by the lack of heat-resistance in varnishes used to make insulating material watertight, will now find this limit raised sharply. Silicone-varnished fabric can be used at temperatures as high as 500 deg. F. without carbonizing.

As a result, it is possible to reduce the size of motors and develop equal horsepower by operating them at higher temperatures. An example: a 415-lb. motor delivered 19 h.p. running at a 'hotspot temperature' of 105 deg. C. With silicone insulation, the weight was reduced to 207½ lb. and 10 h.p. delivered at 175 deg. C. On the other hand, Westinghouse rewound a three-horsepower motor with silicone insulation and had it delivering 10 h.p.

Silicone people are hopeful of 'vacuum cleaners as light as carpet sweepers,' but are still cagey about getting the full advantages for smaller electric motors. If they succeed in packing greater power into motors of the electric razor size, broad new opportunities for industry are indicated. Whatever is achieved in this direction, the silicone experts are definite about their ability to increase the life and reliability of all sizes of motors.

Enamel made from this resin can cut down the space which must be devoted to insulation of ovens and refrigerators. High-temperature-resisting paints can be produced. Mr. Kolderman displayed one which had been baked 120 hours at 250 deg. F. without apparent change.

Second form of the D.C. silicones is a water-white fluid—a lubricating liquid which doesn't become stiff at low temperatures or thin at high temperatures. One current use for this is as a hydraulic fluid for 'damping' vibration of aircraft instruments.

From this type of silicone comes the waterproofing process which cuts down electric leakage of radio equipment in humid zones, and is used to impregnate high frequency condensers. Water beads on

the surface of a treated article, so that there is no conduction between one drop and the next.

The plastics industry is interested in this as a 'mold release lubricant'; the material doesn't mix with the plastic, so that it can be used to line a die in which an article is to be molded; then, instead of sticking inside the mold at the end of the process, the article parts easily from the sides of the die.

Most discussed silicone material is 'bouncing putty' . . . the one joker in the pack, Dow Corning points out. It is a sort of plasticene which flows dismally when left to itself, stretches when pulled slowly, bounces sharply when rolled into a ball, and fractures if struck with a hammer. Since this intriguing material was first announced, producers have been deluged with suggestions for its use in articles ranging from golf balls to chewing gum. Dow Corning is going to try it out on the golf course this summer, but to date there is no known niche for bouncing putty.

It has two very valuable properties, however. First, it is such a fascinating plaything that it arouses a potential customer's interest in its entire family; second, its appearance convinced researchers that it was possible to make silicone rubber.

Dow Corning's silicone rubber, called Silastic, has physical properties similar to those of natural rubber, high heat resistance, resilience and a good resistance to chemical corrosion. This makes it valuable for aircraft gaskets. It is also extruded as a covering for high temperature lead wires, so that, for instance, the ignition system of an automobile need not be spaced so far away from the heated parts. Silastic cannot be combined with other rubbers at present. The strength of silicone rubber is not yet sufficient for use in tires, but Dow Corning, Westinghouse and General Electric all stress that it is just in its infancy, and that a tire may some day be produced which, because of the silicones' high resistance to heat, may last as long as the car.

Earliest research on silicones was done by an English chemist, F. S. Kipping, who devoted his life to the study, retiring in 1935 with the conviction that silicones were very interesting materials which had no commercial use. Later researchers applied polymer processes



which led to the discovery of a whole new field of uses.

Canadian firms have already been making enquiries about certain silicone products, Mr. Kolderman informs **The Financial Post**. Dow Corning intends to arrange a Canadian distributing channel when supplies warrant. Output of the new plant about to open is expected to make some supplies available. Until production is larger and more stable, however, price is expected to class silicones as 'premium materials' for some time yet.

—Jean Edmonds in **The Financial Post**

*EDITOR'S NOTE: The use of silicones will have a far-reaching effect upon our present social structure. Increasing the longevity of motors and reducing their size per h.p. will lead to a great decrease in man-hours in producing, installing and maintaining power machinery.*

## *Germanium Riddle*

**I**TS history reads like a riddle. Known before it was discovered, overlooked and wasted for fifty years thereafter, its value was finally appreciated, but no sooner was it reborn than it was once again consigned to near obscurity.

This almost bizarre chain of facts surrounds the all but unknown member of the carbon family, germanium. Thought by many to be an oddity, this silvery metal is nevertheless considered in some quarters to be of such importance that the heavy shroud of wartime secrecy now wraps it in official mystery.

The known facts, though sketchy, are stimulating fuel for a curious mind. Once tantalized, one's curiosity begins to feed on itself, until the trail leads to Eagle-Picher Company, the only domestic concern recovering the metal in quantities greater than capsule samples. But this is getting ahead of the story.

Strange fact to the layman is the fact that germanium was actually described in detail years before it was discovered. Mendelyeev, famed scientific architect of the Periodic System of the elements, pre-

dicted in 1871 that several new elements—he called them eka-boron, eka-silicon and eka-aluminum—would be found. Fifteen years after the Russian chemist described their physical and chemical properties, Clemens Winkler did at last isolate eka-silicon and called it Germanium. In so doing, Winkler found that his find was an almost incredible fulfillment of Mendelyev's prophecy.

Some of the most significant work in recovering germanium has been accomplished by Eagle-Picher technical men, who first discovered the rare element in waste products of the company's zinc smelter approximately a decade ago. These men explain that the metal is like the 'frog on the knot on the log in the hole at the bottom of the sea,' for the elusive chemical is actually a by-product of cadmium recovery, itself a by-product of zinc recovery, which, in turn, represents only about 5% of the mined ore.

A great deal of searching work followed at the Henryetta, Oklahoma, smelter and the Joplin, Missouri, research laboratories until Eagle-Picher had at last devised a way of capturing and refining it. That a feasible way has been found is mainly to the credit of a persistent group of pioneering metallurgists and chemists, F. G. McCutcheon, H. R. Harner, C. J. Sommerville and Research Director E. W. McMullen.

Four years ago, before Eagle-Picher began salvaging the Winkler metal, germanium's price was \$4,500 a pound, but the world's supply was weighed in grams. Today Eagle-Picher's growing production has pushed the price down to \$200 a pound, and there is talk of an eventual ton or more every year. Their biggest shipment—and the world's too—to date, 15 pounds, came last fall.

Normally, you'd think that a substance costing so dearly would look as precious as its price. However, if you saw a piece of it on a table, you'd pass it off as an innocent looking, zinc-like alloy of no special value. Then, if you picked it up, you'd exclaim at its lightness. Unusual, too, is the fact that it is so hard that it will cut glass almost as easily as a man cuts his cheek during a hurried shave. Further investigation would show its unusual chemical and electrical properties—for example, it is not attacked by boiling concentrated hydrochloric acid.



Few things are yet known, publishable things, that is, about germanium's possible uses. Someday you may have germanium-gold alloy inlays in your molars, for the metal has the exceptional ability to expand on cooling, thus filling every crevice of a cavity.

Then, too, a moderate touch of it in magnesium or aluminum castings is said to make alloys of very high fatigue and corrosion resistance, and suggests utility in the field of small, light-weight aircraft motors or accessories. Even now it is suspected that the good performance of certain Continental magnesium alloys is due to the presence of germanium as a trace impurity in the metal.

The silvery element also imparts special refractive properties to optical glass. In camera lenses that may be translated into sharper pictures.

This rarer-than-gold material is carried in zinc and lead ores mined in the Tri-State district where Missouri, Kansas and Oklahoma join. From the 15,000 tons of this ore milled daily at the sprawling Eagle-Picher Central Mill, hardly more than ten pounds of germanium can be recovered. That's only about a handful for every ore train 350 cars long.

In ultra-simplified form, here's how the recovery technique progresses after the zinc concentrates reach the Henryetta smelter in Oklahoma. First, cavernous roasting ovens burn off the sulfides. The zinc oxides thus formed are sintered—slowly burned with salts and semi-anthracite coal. It is here that dense fumes carry off the cadmium and germanium.

Piped into and caught by a Cottrell precipitator, the fume-carried metals are next dissolved in sulphuric acid. After cadmium separation, the compounds left are of high germanium content. Though once wasted, this valuable remainder is now shipped to a Curie-like pilot plant next to the research laboratories at Joplin, Missouri.

There the friable and dirty bluish gray material containing varying amounts of some twenty metals, including germanium which is worth about a third of its weight in gold, is first oxidized in a furnace, and then mixed with concentrated hydrochloric acid.

Distillation follows to free the germanium from every trace of

the associated metals, and it is in these steps that the chemists' skill is most apparent, for the trick is to know not only what reagents to use but exactly how. Even slight deviations will queer the whole batch. Finally, after ten days in process, about \$80 worth of germanium is cupped in the bottom of a crucible. Unusual among metals is the fact that the refined germanium is made so pure that even the sensitivity of a spectroscope will actually detect no foreign matter.

From Joplin, the precious metal is parceled out to a dozen close-mouthed agencies. It then drops from public sight. When the war is over, it will be time enough to unfold the next chapter of the continuing germanium riddle. In the meantime, it cannot be hidden even by an airtight official information vacuum that germanium is fast taking its place as one of the most unusual metallurgical finds in more than half a century.

—Monsanto

*EDITOR'S NOTE: That scientists can predict future discoveries and events with almost unerring accuracy is dramatically high-lighted by the isolation and current use of germanium. Mendelyeev predicted in 1871 that this element—among others—would be found, and through scientific determination was able to project its most probable weight, color, melting point and other qualities with great accuracy. Similarly in the scientific projection of the next most probable state of social operation on this Continent, Technocracy is able to determine what will be the only method open to North Americans.*

## *Canadian Economic Conditions in 1944*

**E**CONOMIC activity in Canada last year proved to be a record. The index of the physical volume of business based on factors representing the trend of production and distribution averaged 236.8 compared with 235.9 in the preceding year. Productive operations reached a new high point despite the recession in the later months of the year. The remarkable advance, from the outbreak of hostilities to about one year ago, resulted in a level of operations far higher than in any other period in Canada's history. The index in the last month of the year showed a slight increase over the preceding month. Wholesale prices were relatively stable during 1944. The index, how



ever, was  $2\frac{1}{2}\%$  above the average for the preceding year. The marked advance between September 1939 and the latter part of 1943 re-established the parity with the base. The index passed through the base line in July 1943 and has since fluctuated slightly above that level, the index averaging 102.5 during 1944.

The components of the index of the physical volume of business were uneven in 1944 compared with the preceding year. Mineral and manufacturing production were at slightly lower levels. The distribution of commodities was in a considerably heavier volume than in the preceding year. The index of mineral production based on 15 factors receded from 242 to 226, a drop of 6.5%. Coal production was 4.6% less than in 1943 while the decline in gold receipts at the Mint was nearly 21%. It is estimated that the value of mineral production was \$482.3 million in 1944 against \$527.9 million in the preceding year.

The index of manufacturing production which had been 293.9 in 1943 receded  $\frac{1}{2}\%$  to 292.3 last year. The gain in cattle slaughterings was 24.7% and hog slaughterings rose 22.2%. While the output of creamery butter receded 4.3%, factory cheese rose 8.3%. The total output of cheese in 1944 was 178.2 million pounds against 164.6 million in the preceding year. The release of cigars and cigarettes showed a slight percentage increase over 1943. The total releases of cigarettes were 11,666 million while the cigars made available numbered 197.8 million. Due to shortage in the labour force the cotton textile industry was less active in 1944. The raw cotton consumption was reduced from 180 million pounds to 161 million. The output of newsprint showed a slight gain, the total having been 2,991,782 tons compared with 2,982,797. The primary iron and steel industry was more active, the output of steel ingots showing an increase of nearly 1% while pig iron production was 5.4% greater. The output of coke rose from 3.5 million to 4.0 million tons, a gain of 12.8%.

The new business obtained by the construction industry last year recorded a marked increase. Contracts awarded rose 41.7% while building permits in 58 municipalities were 55% greater. Contracts and permits were in much greater amount in 1944, but the index of

employment indicated that actual operations were at a lower level than in the preceding year. The consumption of firm power was 35,151 million kilowatt hours compared with 35,719 million in the preceding year, a decline of 1.6%.

Circulating media in the hands of the public in 1944 rose from \$754 million to \$908 million, a gain of 20.5%. Cash and cheque payments in the first eleven months were estimated at \$78.7 billion against \$68.2 billion in the same period of 1943, a gain of 15.4%. Current loans on the other hand showed a decline of nearly 4%, the average in the period mentioned having been \$1,008 million. The total revenues of the Dominion Government during the first nine months of the fiscal year, that is, from April to December, showed a decline of 1.2%, the total in the recent period having been \$1,940 million. War expenditures receded 12.6% to a total of \$2,422 million. The expenditures under the United Nations Mutual Aid Act rose nearly 21% to \$674.5 million. Ordinary expenditures were 16.6% greater at \$528 million. The national income of Canada, on a tentative footing, moving up to \$9,186 million in 1944, exceeded all previous records. The increase over 1943 was 5.3%, the total in that year having been \$8,724 million. Income originating in agriculture showed a marked gain, while increases in manufacturing and government were of lesser proportions. The maximum monthly income was reached in October of last year when agricultural marketings attained a high level. The standing in December was \$766.3 million compared with \$777.7 million in November. The total in the last month of the year was below the level of December 1943, computed at \$785.3 million. The deposit liabilities of the chartered banks recorded a marked increase during the war period reaching a new high level at the beginning of December last year. The average for the first eleven months of 1944 was \$4,667 million against \$3,969 million, an increase of no less than 17.6%.

#### —Agricultural and Industrial Progress in Canada

*EDITOR'S NOTE: The year 1944 was the most prosperous in Canada's history. It is a major indictment of the Price System that it should have taken the greatest war of destruction the world has known to bring us prosperity.*



*(Continued from Page Eighteen)*

makes interesting reading. The first report was made nearly 45 years ago, when the late James Mackintosh Bell and Dr. Camsell surveyed the country. They recorded cobalt bloom stain on lake-wide rocks, and thirty years later Gilbert LaBine read the account, associated the stain with his experiences in Ontario, arrived at the conclusion that there was silver in the rock, and in May 1930 made the great discovery. It is surprising to a layman to observe this lag between discovery of signs of mineral wealth and actual exploratory work. Other examples are the Geological Survey publication of 1898 which reported gold at Yellowknife, 40 years before the ore was produced; and Franklin's record of oil seepages in the Norman area nearly a century before the first well was drilled.

The way we live and travel, and nearly every other phase of modern civilization depends upon the mining of coal, metals and other minerals, and this wealth from minerals is new wealth, creating jobs, products and opportunities. Modern methods are providing assistance in tapping hidden sources of mineral riches.

Prospectors are not gypsy-like persons wandering over the rocky hinterland with hammers, knocking off pieces here and there. Electrical determinators are commonplace; those who search for ore are geologists. Advanced methods are necessary, because resources of metals are being rapidly depleted, and if postwar activity is to measure up to hopes then immediate discoveries must be made to stimulate private development. Only new finds can replace exhausted mines, and new mines have been coming in very slowly. A table prepared by a committee of the Canadian Institute of Mining and Metallurgy and presented to the Advisory Committee on Reconstruction last year (1943) shows that in 1942 Canada's metal production came from mining areas discovered as follows: 63% prior to 1910; 11% between 1910 and 1920; 21% between 1920 and 1930, and only 5% since 1930. Mining is important business in Canada, from the standpoint of employment, purchase of machinery and supplies, use of transportation systems, and export. In the year before the war broke out, the number of persons directly employed by the mineral industries was 107,000,

and these supported an estimated 1,200,000 people, or one-tenth of Canada's population.

Under the most difficult and trying conditions the gold mining industry has been trying to maintain its properties in a position to absorb the maximum number of men at the end of the war. Today, with strategic minerals in fairly adequate supply, attention has been turning again to gold. In this resurgence of exploration more than a dozen areas across Canada have taken the spotlight, boasting discoveries of ore of varying importance. In the first six months of this year (1944), mining claims recorded in Ontario numbered 5,570, an increase of 3,770 over last year.

Canada's biggest real estate boom today is in mining claims in the Yellowknife district of the Northwest, where investors are apparently hailing recent discoveries as heralding one of Canada's premier postwar gold camps. Mines cannot be brought into production just now, but they are being found and prospected, so that they will be ready to go into action at the war's end as great providers of employment.

Quebec has been supplying a great deal of ore news and many

drills are at work. Development has been steady since the spectacular discoveries of gold and copper in the western part of the province in the years around 1923. Latest gold ore excitement has broken out at Val d'Or, where an extension of the Porcupine break was discovered at the end of July (1944). The mining recorder's office at Amos was overwhelmed as prospectors applied for licenses and registered their claims.

The Northwest has been in the news these last few years for other than metallic mineral discoveries. When Alexander Mackenzie, the young Scottish fur trader, travelled down the river that now bears his name in 1781, he got his shoes blackened with mineral tar, where today they are producing oil wells. Just about the only thing for which Canada can thank the Japanese is the opening up of this territory by road, air and pipeline. The Minister of Mines said in the House of Commons this summer (1944): 'If Japan and the United States had not gone to war, their resources would have been lying there just as they have been lying for a hundred thousand years. But the Japanese broke local



and the Canol project is complete, applying oil for military needs. There is hope for further discovery, and the territory is opened to all oil seekers who care to make their knowledge and capi-

Hundreds of miles to the south are the Athabaska tar sands, now the subject of research looking for feasible means of extracting oil. They cover 10,000 to 30,000 square miles, and the United States Bureau of Mines has estimated that they contain 250 billion barrels of oil.

Still more fascinating than the story of mineral discovery is the account of development of agriculture in the North, because farming seems to fit better into the northern scene.

Agriculture is actually the biggest of the far North's unknowns. In the Upper Peace there are 10,000 farmers cultivating over a million acres of land, but the Peace River territory is not the northernmost limit of agriculture. Experimental sub-stations have been maintained in the Yukon and the Mackenzie basin by the Experimental Farms System for more than 20 years, and an expansion is planned in the near future. With regard to expansion

of experimental work, it is interesting to have a report from Dr. E. S. Archibald, Director of the Experimental Farms Service of the Dominion Department of Agriculture. Dr. Archibald, a Nova Scotian with degrees from a half-dozen universities, is enthusiastic about the possibilities of farming in Canada's Northland, and has been directing surveys covering northern British Columbia, Alberta, Yukon, and the Mackenzie River basin. While the vastness and the relative inaccessibility of this territory preclude rapid examination or intensive experimental developments, much has been accomplished. In 1943, Dr. Alfred Leahy, soil specialist of the Experimental Farms, made an exploratory survey of soil conditions and agricultural possibilities along the Alaska Highway and on the Whitehorse-Dawson City route. As a result of this survey, and a flying trip into the southern Yukon by Dr. Archibald himself, an article dealing with agricultural possibilities appeared in the **Canadian Geographical Journal** in July. This summer (1944), Dr. Leahy is again in the Yukon, to complete his survey of the highway territory and then swing eastward to the Liard and Mac-

kenzie River areas. Among his assignments is the selection of sites for two agricultural experimental sub-stations, where full-fledged work will be established as quickly as possible to determine the agricultural possibilities of the regions and promote as much development as local conditions permit. 'It is evident,' says Dr. Archibald, 'that the agricultural possibilities of the north country are well worth investigating. I cannot emphasize too strongly, however, that the Mackenzie Valley does not and may not for some time, offer a field for extensive agricultural settlement. Distances are too great, the environment too rugged, and potential markets too small, to justify more than agricultural production subsidiary to other enterprises—fur trade, oil and mining.'

Climate alone is not a bar to agricultural production, as witness the yields of certain crops even within the Arctic Circle in Canada, and far north in Russia. At Beaverlodge, in latitude 55 degrees north, tests have been made of various crops over a period of from 10 to 15 years, with these average yields: Marquis wheat 36 bushels, Victory oats 86

bushels, O.A.C. No. 1 barley 4 bushels, and winter rye 40 bushels. Horses thrive on the range along the 60th parallel; cranberries ripen beside Great Slave Lake; vegetables and green feed grow at the Thelon sanctuary, 63 degrees. W.C. Bethune reports common wild fruits occurring almost to Arctic tidewater, and vegetables at Coppermine and Bernard Harbour on the Arctic coast. At Good Hope, close to the Arctic Circle, potatoes have been grown for two generations, and vines were 20 inches tall on June 13th, with a yield of 393 bushels per acre.

All of the romantic Northland calls aloud to tourists. Practically every family in Canada and the United States is on tiptoe to explore the Northwest just as soon as it can get gasoline and tires. It would be difficult to find another region in the world with equal appeal in beauty of mountains, rivers, glaciers, lakes, and alpine valleys abloom with myriad flowers, while the wealth of game and fish will attract thousands. Development, however, must wait the return of peace, and many improvements must be made to the Alaska Highway before it can satisfy the demand



tourists. Extensions will be required, to reach lakes and settlements. Rest houses and hotels must be provided. But all of these will be worthwhile investments if they bring to Canada a steady flow of tourists, both because of the business gain and the friendship value of such visits.

One of the strange uses of the land they opened up which would surprise the spirits of early fur traders is the grazing of reindeer on a commercial basis. It has been found that the Arctic lichen tundra serves well as pasture land, and reindeer have the advantage of not requiring shelter or much human attention. The Dominion Government took the first steps in 1919 with a view to broadening the basis of subsistence of the natives, when it appointed a Royal Commission to explore the possibilities of developing a reindeer and musk-ox industry. In 1935 a herd of semi-domesticated reindeer from Alaska was delivered on the Mackenzie, and by 1942 the original 2,370 deer had grown to more than 9,000. Headquarters for this unique ranch is in latitude 68° on the right bank of the Mackenzie River, 40 air-miles from Aklavik.

These, briefly, are some of the resources of Canada's Northland. Old problems of development remain, but will be conquered by sufficiency of capital applied to equipping enterprising people to meet northern conditions. The measures taken as a defence against Japanese aggression will turn to advantage to a peace-loving Canada, in cooperation with her neighbours.

Just recently, the Vice-President of the United States suggested that Canada, the United States and Russia should confer on Arctic matters of mutual interest. International cooperation is particularly important in the Northland, to pool the findings of scientific experiments and trial-and-error test. Recognizing this, the Canadian and United States governments have integrated a program of basic geographic and resource surveys. In the Northwest there is a big program under the United States-Canadian North Pacific Planning Project, designed to assess the potentialities of the country in preparation for postwar economic growth. This international study of the comparatively unknown spaces of Alaska, Yukon, Northern British Columbia and part of the

Northwest Territories was inaugurated in January 1943. Canada's own Advisory Committee on Reconstruction recommended last September in connection with immediate postwar employment: (1) that provision be made for training thousands of prospectors; (2) that adjustment be made in respect to taxation that would stimulate prospecting and mine development and mineral recovery; (3) that extensive aerial surveying be undertaken; (4) that steps be taken toward provision or improvement of transportation; (5) that the provinces be invited to confer with the Dominion in a review of 'Blue Sky Laws' with particular reference to their effect on prospecting and mine development; (6) that a body, on which the mining industry should be adequately represented, be set up to investigate the general effect of high taxation on mines and more particularly the possible permanent loss of resources.

Transportation presents merely a handicap to be overcome. Every schoolboy recalls the romantic adventurers who sought the will-o'-the-wisp Northwest Passage. Tomorrow's Nor'west Passage seems to be an aerial one, because

people in a hurry to get from continent to continent of the northern hemisphere will find their shortest route over the top of the world. Today there is the Northwest Staging Route, the Alaska Skyway, over which men and freight are carried from airport to airport through the wilderness from Edmonton to Alaska. It has meteorological services and radio beacons, installed by Canada and in operation before the United States came into the war. Over it were flown men and aircraft to Alaska and the Aleutians when the Japanese were threatening this Continent. The Northwest Staging Route has opened up the Hudson Bay territory, over which great airplanes beat an air path to Europe.

Completion of the Alaska Highway fired the imaginations of people all over the continent. Today there is a joint Canadian United States Traffic Control Board to deal with applications for travel, which is at present confined to persons on official business, and to bona fide prospectors seeking minerals of strategic importance. All traffic for the highway is channelled through Edmonton, which calls itself the 'crossroads of the world—where



the Alaska Highway begins.' This  
ty now holds the unique record  
being one of the greatest mili-  
ry air-freight centres of the  
orld, as it was the greatest com-  
ercial air-freight centre before  
e war.

The days of Service's sour-  
ough are retreating in the face  
innovators who are boldly and  
tionally transforming nature to  
eir needs, but still there must  
e kept in mind the traditions  
hich move, or at least influence,  
uman beings. Today's problem  
not merely a matter of con-  
nering the North. The way to do  
at has been shown. What is  
eded now is to domesticate it.  
he Canadian Arctic has had its  
eat names, like Frobisher,  
avis, Hudson, Franklin, Ross  
d McClintock, but it was the  
smiths and the Joneses who dis-  
covered that the 'icy fastnesses'  
ould be tamed. They were ordi-  
y people, traders, miners and  
rmers, who pursued their for-

tune northward, and made their  
homes there. The future of the  
region will depend upon people  
who have initiative, a desire to  
succeed, and pioneer courage.  
Many will come from the ranks  
of returned service men, who,  
with adventure still unsatisfied,  
will join the great army of ex-  
plorers seeking to unlock the  
treasure chest of the north. It is  
not a venture for weaklings. The  
Arctic climate may be kindly to  
those who go prepared for it, but  
no one must be careless when it  
shows its teeth. Scientific study  
now being conducted by the  
Canadian Department of Mines  
and Resources and the Exper-  
imental Farms Service will lay the  
groundwork for a rational in-  
crease in population throughout  
the Northland, but, aside from  
mining, any large shift of popula-  
tion will have to await economic  
developments which cannot yet  
be foreseen.

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U. S. TROOPS BURNED THOUSANDS of sheets and blankets and ran a steam-  
er over tons of crockery before abandoning a large military hospital in Western  
England recently, J. B. Priestley told a Labor party campaign meeting at Slough,  
England. Seven grand pianos also were destroyed, he added. Mr. Priestley said the  
solders and men were reluctant to carry out the orders and that the reason they did  
was because they 'still were chained to the lunatic system of profit before distri-  
bution.'

—CANADIAN PRESS

# A Question Answered

*Total Conscription will be more necessary in the coming postwar war than it is and has been during the period of armed conflict. North America must mobilize its resources for the common good.*

**I**SN'T it rather silly to advocate Total Conscription in view of the approaching end of all hostilities and the demobilization of the Armed Forces?

Not at all. Total Conscription will be more necessary in the coming postwar-war than it is and has been during the period of armed conflict. During this present war North America has mobilized only a minor part of her manpower for actual combat; and slightly more than half of her industrial production for the service of supplies. We have been waging this war with Price System methods and winning it the hard way. In the postwar-war that will break out all over America when fighting ceases on the battlefield, the entire population will be engaged.

You say that hostilities are coming to an end. It would be more correct to say that when the battlefield fighting stops, in

foreign lands, the scene of hostilities will be transferred to the home front. 'After the Germans and the Japs cease to try to kill us, it will be harder for most of us to remain alive than it is at present.' (*Fortune*, December 1943.)

Remember this, there were two purposes involved in the design of Total Conscription. These were, first, to provide an overall, industrial, military and social design of national operations for winning this war in the shortest time and at the lowest cost in lives and natural resources; and, second, to provide a design of social and industrial operations to guide America through the transition period when the war came to its inevitable end. We chose to ignore the first purpose of Total Conscription and have waged the war the hard way, the expensive way, the Price System way. We are winning but it is in spite of high cost Price System methods.

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s. America's great technology doing the job, plus the fortitude and sacrifices of the men and women in the Armed Forces.

In the postwar era we may choose to ignore the second purpose involved in Total Conscription and attempt to revert to Price System methods as usual. But the past record of business and politics indicates no probability whatever of their capacity to solve America's postwar problems. All that business ever knew was how to buy low and sell high; and how to conspire to maintain scarcity. In essence, this means that the function of business is to prevent distribution. All that politics ever knew was how to juggle conflicting opinions; and manipulate one minority pressure group against another in order to maintain the status quo. In essence this means that politics functions to prevent social change.

These functions of business and politics are normal to an economy of natural scarcity. When any area reaches a stage of potential abundance, these historic functions of business and politics become actively anti-social. In the face of National Danger from the Axis Pact of

fascism abroad, we found that we had to abandon the traditional functions of business and politics temporarily, and to a certain extent, so as to win this war. This limited abandonment of Price System methods was carefully supervised and severely restricted in order to affect the status quo as little as possible. As the postwar-war for survival spreads throughout the decaying fabric of our social order, the necessity to abandon Price System methods completely and to set technology free will become ever more pressing.

Remember, there will be no end to the postwar-war; there will be no glad, mad day of armistice; no joyous ringing of bells and blowing of whistles to signify peace; no returning home to our loved ones, ever. We will all be in the same boat then. The killing will go on and on under the old familiar pattern of operations entitled 'The Peace of the Price System,' only it will be intensified and magnified by the application of more destructive technology. All the factors of social instability will experience a period of great expansion. Juvenile delinquency will be only a ribald joke when the entire social sys-

tem is delinquent. It will be a succession of black, hopeless months, and perhaps years, wherein the aspirations of men for a better life will be driven into the underground of despair and futility.

The overwhelming majority of Americans will battle against each other in want, insecurity and fear for the dubious privilege of chiselling an uncertain existence out of a dying economic system. While high overhead, above the muck of murder and perversion will reign the blessed, microscopic minority revelling in luxury and abundance, and pulling the strings to perpetuate the God of Things as They Are. This will be the picture of our postwar-war in the richest Continent on earth which is capable now of providing abundance, security, leisure, equal opportunity and physical democracy for all citizens from birth to death. **No tongue or pen can do adequate justice to the hypocritical insanities of Price System methods of operation.**

Remember, too, that the only possible outcome of this postwar-war is either a complete collapse of the entire social system with ensuing social chaos, or another

glorious foreign war against some new, great 'evil' thousands of miles away. Foreign wars are always prescribed for domestic difficulties by the quacks who control the Price System. Yet indeed, our prospects, individually and collectively, in the postwar era are blacker than the blackest hell so long as America continues under the tyranny and regimentation of the Price System.

And you say America does not need Total Conscription! What strange social blindness this is! If you need a placebo for your tender sensibilities, perhaps you can think of it as Total Mobilization. The name doesn't matter. America must mobilize all of its resources for the common good. That's evident, isn't it? The facts are that we have the Men, Machines, Materiel and 'know-how' set up and operate an economy of natural abundance here, right now. Moreover, we have no choice in the matter but to do or perish.

We will have to adopt a new concept of citizenship. We will have to abandon our present ideology of **Self Service To Hell and To Hell With Everybody Else.** We will have to go in for National Service from All a



profits to None. We will have to tear down all the stinking Gods of the Market Place and set up a new ideal called 'America the beautiful.' We will have to organize our entire social system along scientific lines in obedience to the physical laws by which alone it can operate successfully. We will have to relegate the politico-business method of operation to the same limbo where went the divine right of kings, the philosopher's stone of Alchemy,

and the oxcart of our grandfather's day.

This we will have to do right here in North America in the coming postwar era or pay the penalty which has always been expected for attempted violation of physical laws.

Do you still think we can win the looming postwar-war against ourselves without Total Conscription? Wake up and investigate Technocracy!

—Public Speakers Division 8741-1

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FROM RUSSIA COMES NEWS of the discovery of a method of growing pine trees which are expected to produce logs of 20 feet or more in length that will yield boards free from knots. This is something for loggers to think about, if true, and the explanation seems plausible enough, comments *The Forest Log* of the Oregon State Board of Forestry, Salem.

By this method the young pine is allowed to grow a bushy growth near the ground until the tree is about eight years old. From that time on no branches above this lower growth are permitted to develop. This is effected by pinching off all side buds as soon as discovered. Ample nourishment for normal growth is obtained from the bushy branches near the ground.

After the tree has reached a height sufficient to yield a log 18 to 20 feet long, it is allowed to form a normal top. Thus with no branch-bases within this limbless area, the entire log from pith to sapwood will be wholly free from knots.

—B. C. LUMBERMAN

WORLD PRODUCTION OF WOOD-PULP in the first year after the conclusion of the war in Europe, including 600,000 tons now in storage in Sweden, is estimated by the United States Department of Commerce, at 24,348,000 tons, while consumption needs are placed at 23,822,000 tons, indicating a surplus of 526,000 tons. The estimates of production are based on the assumption that wood-pulp output, particularly in the United States, Canada and the northern European countries in the first year will be at maximum capacity, consistent with conditions of manufacture, labour, raw material supply, and that shipping from northern European ports will be possible soon after the end of active warfare in Europe. Production in the northern European countries is estimated at 4,377,000 tons, to which may be added the Swedish supply of 600,000 tons in storage.

—B. C. LUMBERMAN

# Notes on Organization

*Technocracy Inc. stands as a living demonstration that human initiative can achieve what the incentives of this Price System have never succeeded in inducing—the creation of a spirit of 'one for all and all for one' and a morale that is continent wide.*

**I**N a continent-wide analysis of the spread of the Chartered Sections of Technocracy Inc., certain salient facts have been noted which merit discussion. In those regions where the advance has been most rapid, notably on the Pacific Coast from San Diego to Vancouver, the basic reasons are not difficult to find. In the first place, it becomes evident that the citizens there are more open-minded and ready to weigh that which is new and perhaps completely divergent from their inherited conceptions and beliefs. This attitude has proved most beneficial in that Technocracy has been given a fair and complete analysis and thus, with an unavoidably favorable decision rendered, a very considerable group of people are now engaged in furthering the activities of Technocracy Inc.

A second reason lies in the development of capable leadership. As has been pointed out before, the leadership of Technocracy is

definitely not limited to engineers and scientists. Whereas it is true that the original plans and the basic principles of Technocracy are largely the work of engineers and scientists, neither they nor the present leaders of Technocracy Inc. ever thought for a moment that the successful working out of the plans could be accomplished without leadership drawn from all professions and industries. A case in point is the able Section leadership on the West Coast which, as evidenced by its variety of capabilities, is fully representative of the functional capacity to be found in corresponding diversity of occupations. The ability to be a leader, then, is latent in almost every man or woman; and the region on our Continent where such leadership is sought for and when discovered, developed and trained, will be those where Technocracy Inc. will most surely and rapidly push forward towards its goal.



Any living organism seeks its food. The food enters one end of the alimentary canal; waste is eliminated at the other. What occurs in between the two is known as functioning.'

The organizational structure of a Technocracy Section is, by analogy, equivalent to that of any other dynamic organism. The structure is schematically defined in *By-laws and General Regulations*. The problem of organization is, first, the achievement and preservation of the Section of such a state of organic health as shall enable the best possible to be made of the organism's intake of equipment, money and personnel in furthering its growth and tactical effectiveness.

The routine business of keeping adequate records on Section affairs must obviously be carried out along lines familiar to any office manager. It will be noted that the affairs of a Technocracy Section are inherently more complex than those of the ordinary small business; also, the influx of new members must be expected to accelerate by fits and starts as events, in their inimitable way, stimulate the latent intelligence of increasing segments of the populace. Therefore, the office routine must be as flexible with these things in mind. It is the responsibility of the Section Director, the Treasurer and the Secretary to see that these affairs are suitably planned and capably carried out at all times, as a primary requisite of sound organization. A sloppy set of books or minutes can tie up Section development as effectively as an injured spinal cord can hinder the growth of the living organism.

In planning this organization, and the organization of the various standing committees, many members have some difficulty in realizing that the type of control with which they have become familiar in the course of their previous lives partakes of some noxious elements of business and political administration. When an occasional Section becomes sick and fails to function properly, investigation often discloses the 'bottle-neck' bureaucrat, 'business as usual' obstructionist, the 'armchair' strategist or the 'assumption of power' theorist—all cursed with their earlier conditioning, subverting the operations of the Section down to that level, quite innocently unaware of the untechnocratic character of their behavior. Eventually, these people realize that the purpose of an interference control is to *interfere*, to slow a thing down below its natural rates of function. Admittedly, systematic and routine controls must be exercised in order to establish smooth and flexible routine processes—but always with a minimum of interference. Technocracy must look to the industrial flow-line, to the continuous straightline productive process, for its functional prototypes. In 1914 the mobility of the army was governed by the walking speed of the slowest man. Today the substandard truck or defective part is scrapped or corrected at the factory before the army ever sees it. This is a technique of control involving the elimination of interference, the improvement of efficiencies, the speeding up of processes, the determining of optimum rates, commensurate with steadily improving quality of output.

Returning again to the biological analogy, the elimination of waste indispensable to healthy development consists, in the Technocratic organism, of the 'conditioning out' by individuals or by the various sub-divisions of the organism, of useless or injurious modes of behaviour, combined with the positive 'conditioning in' of useful capacities, in the individual's course of getting his array of abilities into phase with Section operations. It sometimes happens that an individual proves to be completely unsimilable: his usefulness has been impaired beyond any hope of even a percentage salvage. Such events are rather tragic in their implications, they are wasteful and disturbing in their effect, but the law of proportionate aggregates states that they are unavoidable, even as also that law brings forth an occasional directive genius. Similarly, somewhere, occasionally some healthy man eats a ptomaine oyster. The action taken must be drastic: if he waits for nature to take its course, the healthy man will probably die.

In an obviously extreme case the Section must exercise its powers of expulsion. When this occurs, however, it should not be considered as an act of justice or of retribution (in such a philosophical muddle it is always an open question who should expel whom), but rather a case where the observable facts clearly demonstrate a member's unfitness to be absorbed into the functional pattern of the whole. Adequate facts must of course be clearly established, for philosophical hypochondria in a Section seldom justifies a surgical operation. It serves rather to indicate a deeper fault.

People who are neglectful and slovenly in their living habits do not exhibit healthy growth. Poor digestion, and tendency to quarrel with or merely pass off as unassimilated waste most of the things one eats, are symptomatic of an unhealthy organism. So are the gallstones, boils, the ulcers and the flabby muscles which people permit themselves to acquire. In the same way, where squabbling factions and internecine bickerings cur in a Technocracy Section, as sometimes happens, it is usually the operational structure that is at fault, not of the individuals, even though as individuals people sometimes forget that they do not have to like each other, or to approve of each other, in order to get together and do an engineering job. More often such goings-on indicate that the operational structure is poorly designed and that new members and members alike are not becoming conditioned.

A healthy organism equipped with sensitive endocrine nervous control (that quality often called 'awareness' and healthy enzymes, plus adequate living conditions, will exhibit a quality of initiative in increasing range and degree of its own function. This is as true of a healthy Technocracy Section as it is of an individual member. Since no Technocrat ever received pay, except in those few instances where subsistence is allowed for full-time service, the question of Price System incentives is out; and Technocracy stands as a monument, a repudiation of the idolatry of Price, a living demonstration that human initiative can act without what the incentives of this Price System



er succeeded in inducing — the  
ation of a morale that is Continent-  
e in scope; and a set of objectives,  
n which that morale is based, that  
a materialization of the spirit of  
for all and all for one': of North  
erica, now and forever.

uch a unique esprit-de-corps has been  
unfulfilled dream of the philosopher,  
general and the statesman alike,  
ughout all time. Yet only now, at  
is its realization made possible, in  
inevitable, in the dispassionate and  
istable advance of Science. Science,  
ity for good or ill, sublimely im-  
onal, cares nothing for the prejudice,  
e or desire of the individual or even  
he nation. Individual or national  
it is hardly within the domain of  
nce. Yet the destiny of Science must  
fulfilled and in its fulfillment the  
ty of opinion and of individual self-  
andizement shall be made subordin-  
to the carefully determined require-  
ts of the task. In the fulfillment of  
great destiny shall be found also  
fulfillment of the human heart's de-  
Technocracy, in bringing to the  
d 'a new governance of man and  
igs' brings also a new order of hu-  
loyalty and a far greater patriotism.

he work that Technocracy Inc. has  
mplished, in the face of collective  
ay and indecision, is worthy of any  
respect. Obviously, Technocracy's  
vements to date are but a fraction  
that must finally be accomplished;  
what it has done has been the work  
member volunteers, having no re-  
ces except their own.

chnocracy likewise claims the re-  
due to Science in its final matur-

ation as the supremely dominant ele-  
ment in the organization and ordering  
of society itself. According to *Encyclo-  
pedia Americana*, 'Whatever the future  
of Technocracy, one must fairly say that  
it is the only program of social and eco-  
nomic reconstruction which is in com-  
plete intellectual and technical accord  
with the age in which we live.'

The statement has been made that,  
once a member has become in any way  
a conditioned Technocrat—has, for ex-  
ample, gone through even half of the  
*Technocracy Study Course*—it is most  
unlikely that he will ever be anything  
but a Technocrat. This is no idle asser-  
tion. Whether such respect be conscious  
or unconscious, openly or grudgingly  
felt, it must be accorded.

In viewing the Technocracy Section as  
analogous to a living organism, the  
member is compelled to respect the part  
he himself plays in its growth and de-  
velopment. Whether that part—his in-  
dividual job—be great or small, it will  
not be treated lightly. Realizing the in-  
terdependence of the whole Organization,  
he must understand that, to some extent,  
the whole operation depends upon him-  
self, and that he must never let it down.

The member accepts the job which he  
finally intends to fulfill. His first re-  
sponsibility is to persist in the fact of  
any and all difficulty until the job is  
mastered by him, with or without help.  
His second, and equally important, re-  
sponsibility is to train another member  
to stand in, should need arise, as his  
deputy. Then, the unforeseen disaster—  
sickness, accident or removal—shall not  
cause any breach of function and con-  
sequent injury to the Section's oper-

ations. The soldier on guard at his post knows that to leave it constitutes a breach of discipline and a danger to all. He knows that the penalty to him will be severe, and to his unit possibly disastrous. The Technocrat, however, is not made subject to disciplinary action in the military sense—for discipline he must look to his own knowledge, loyalty and integrity. Yet his position on his job is essentially no different—in fact, the ultimate importance on his job is far greater, regardless of what his job may be.

It is sometimes found by new members of 'superior' self-esteem that their particular Section, newly formed and struggling with new problems or organization, is not by any means capable of discharging its duties. Perhaps, then, the Section is not worthy of great respect. Be that as it may, Technocracy Inc. as a whole, its achievements and its objectives, must constantly be borne in mind as the Section's pattern and long-range aim. It then becomes the member's unavoidable responsibility to help bring his Section up to standard, overcoming whatever inexperience, ignorance or shortness of vision and judgment as may happen to stand in the way. He will ultimately accomplish this in the same spirit of cheerful co-operation and personal tolerance as he would instil in

others! His patience and fortitude will be, if not inexhaustible, at least equal to the strains. No discouragement will turn his determination to find ways and means of seeing his job through. In this he will display those essential qualities of human leadership which have already been so fully demonstrated by the builders of Technocracy in the past. This is the challenge to him who would lead: he is first and foremost a loyal capable and untiring follower.

Does this constitute a demonstration of heroism and moral nobility above the normal human level? It does not. It is the simple result of the individual's required understanding of the factors entering into the problem—the circumstances, the people he works with, the requirements of the job, and himself. It constitutes merely his refusal to be governed by any considerations other than the facts in the case, and his refusal to allow himself to be pulled, pushed or tossed about by ill-adapted internal discharges of those complex protein derivatives, his own glandular hormones—those formidable chemical weapons which may as surely help him to success when they are correctly applied, as to failure when they are allowed to run out of control. A Technocrat learns about handling emotional responses in others; he also acquires controlled skill in the use of his own

★ THE NUMBER OF PEOPLE WORKING on farms today is smaller than at any time in the past 20 years, which is as far back as Agricultural Department records go. Output per farm worker has gone up 28% during the past four years. The number of acres harvested per man has risen 14.5% during the same period.

What has happened in wartime is a speed-up of a long range agricultural mechanization. The story of what that has meant in farming is shown by the fact that in Colonial times 90 out of every 100 people in this country had to work on farms to grow enough food. Now the ratio is just the reverse. —WALL STREET JOURNAL



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. Encyclopedia Americana says: 'Whatever the future of Technocracy, we must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Bunde (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves in to an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Can We Win the Peace?

**I**N THE machinery of the military control commission in Germany, as in Washington, men closely linked with German cartels and friendly to German business and finance occupy key posts. The memberships of the Technical Industries Disarmament Committees in FEA at Washington were disclosed to the Kilgore committee, and they contain the names of many men from big concerns closely linked with I. G. Farben before the war. Testimony before the committee showed that the Germans are planning to utilize these old connections, and it is the duty of the Kilgore committee fully to explore them and to make the facts known. In this connection I want to call attention to an interesting statement on page 534 of the committee transcript, a passage in an FEA memo on German penetration of French finance during the occupation. This says that all enemy banks were put under German administration, including 'American banks. The Chase Bank and Morgan et Cie., however, the only two American banks which continued operations, received special treatment.' Why did these two leading American banks receive special treatment from the Germans? The question is of especial interest because Chase is the Rockefeller-Standard Oil bank.

—I. F. STONE in *The Nation*

(SECTION STAMP)



# **TECHNOCRACY DIGEST**

**The Sun Bomb's Social Impact**

**Rushing Toward Chaos!**

**Science in the Social Field**

**Technology Revolutionizes Farming**

**A Ten Year Battery**

**The Story of Pulp and Paper**

**'So You Can't Have Health?'**

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# TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS  
COUNTRY FOR SOCIAL CHANGE

SEPTEMBER, 1945

VANCOUVER, B. C.

No. 8

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# Rushing Toward Chaos!

THE first impact of V-J Day on employment in the U.S.A. probably will be more stunning than the blows struck against the nation's economy by the great depression.

The peace developments in the Japanese war this week confront the country with unparalleled industrial chaos at home, where 10,000,000 workers faced deprivation from their means of livelihood, not to mention millions of returning veterans who will need jobs.'

With these words **PM** newspaper in its August 11th issue heralded the arrival of the post-war era.

The axe has already fallen on tens of thousands of Canadians and hundreds of thousands of Americans. This to the peoples who voted in political parties that promised them a minimum of re-conversion dislocation and full employment.

Technocracy points out that it would be foolish to ask the Government to keep producing unwanted war materiel, merely to provide jobs. Instead of plane plants, ship yards, and munition

factories we now need housing, roads, hydro-electric and other public projects. Emergency measures are required immediately to pour our manpower into useful channels.

World War II has taught that the excuse of 'no money' is meaningless. The artilleryman who has shot away \$50,000 worth of shells in an afternoon, or the tank crew who have had a \$200,000 tank blown out from under them and then gone back for another, or the airmen who have baled out of a burning bomber costing \$1,000,000 will take a dim view of a social system that shoves them on the relief rolls, the bread lines, and the freight trains because 'there is no money.'

At present, North America is rushing toward social chaos. Today, even more than at any time in six years of war, the citizens of this Continent need Total Conscription of Men, Machines, Materiel, and Money with National Service from All and Profits to None. Only through such a program can we make a smooth, safe transition from war to peace.

—The Editor

# The Sun Bomb's Social Impact

*Every technological advance has been a bomb disintegrating the Price System structure. But to the average person it has been comparatively slow and unspectacular process. Then, with the impact of the sun bomb, millions of citizens in a dazzling flash have seen the black mountains of technological unemployment in the postwar period. In the midst of the chaos and confusion caused by clinging to Price System methods in the Power Age, Technocracy goes calm about its task, the only Organization in North America that is preparing to utilize scientific discoveries for the social welfare of mankind.*

THE use of atomic energy—which is being called 'possibly the greatest scientific discovery of all time'—is an event of planet-shattering consequences in war and peace.

The atomic bomb that was used against Japan produces more than 2000 times the blast of the largest bomb ever used before. The Halifax Explosion of 1917, in which 3000 tons of TNT discharged, was only one-seventh the impact of this new scientific missile. One atomic bomb equals five trainloads of TNT, or two cargo shiploads, or 6600 Flying Fortress loads during their first strikes against Berlin, or four times the weight of the heaviest U.S. day's assault against the entire Japanese home islands, or forty times the weight of the biggest assault of the London blitz. And the bomb is said by the science editor

of the London **Times** to contain only about one pound of uranium. The whole mechanism is reported by a British air ministry official to be just 400 pounds.

The target, Hiroshima—an important Japanese army base—was razed 'as if by a bulldozer.' General Carl A. Spaatz, strategic air force commander, said that 4.1 miles of the city's built-up area of 16 miles were wiped out.

Tokyo radio broadcast that the impact of the bomb was so terrifying that practically all living things, human and animals, were literally seared to death by the tremendous heat and pressure engendered by the blast. All the dead and injured were buried beyond recognition.'

President Truman disclosed that the Germans 'worked feverishly' in search of a way to use atomic energy but failed. Mr.



mile American, Canadian, and British scientists studied the problem and developed two principal plants and some lesser factories for the production of atomic energy. 'We have spent two billion dollars on the greatest gamble in history—and won,' the President said.

The most simple explanation of the terrific explosive that is North America's top secret weapon is that scientists have harnessed the power of the sun and scaled it into the 'atom bomb.'

The sun's power is its heat, but it does not come from ordinary combustion, as in a simple fire. Ordinary fire, molecules of fuel, subjected to heat, come apart, and its action releases energy which appears as heat, light, and other rays. The sun would have burned out millions of years ago if this were its only combustion. Its great energy—heat, light, and other rays—comes from the separation of the atoms which are the smallest parts of an element that can exist and which make up all molecules, and from the shattering of the atoms themselves, which releases infinitely greater amounts of heat and energy than ordinary molecule combustion.

Scientists have known for gen-

erations that if all the atoms in a solid body or even a quantity of gas the size of a pea were to disintegrate simultaneously incalculable power would be produced.

Scientists have pursued 'atom smashing'—attempting to duplicate what happens on the sun—for many years, but it was not until the last decade that they found a substance on earth whose atoms they could actually split apart. The official announcement that uranium is the basic material of the atomic bomb gives the clue to what the bomb is and how it operates.

Uranium was first isolated in 1789 and named after Herschel's discovery of the planet Uranus. Half a century later, scientists discovered that what was thought to be uranium in 1789 was in reality uranium oxide. Minute quantities of the pure element eventually were obtained, and from this the scientists of the 20th century deduced that uranium had an atomic weight of 238—that is 238 times heavier than the element hydrogen, which has an atomic weight of one.

In the early 1930's Enrico Fermi, Italian physicist, who is now at the University of Chicago, discovered that uranium bombarded

by powerful electronic and atom rays produced a metal chemically the same but with different characteristics. His discovery led to the isolation of uranium 235, which apparently is the basis of North America's new atomic bomb. U-235, as it is commonly called, is an isotope of uranium. It has the same chemical properties but differs in atomic weight, being just three index points lighter.

In other world-famous laboratories physicists went to work and for nearly 10 years got nowhere. They could not verify the new element. They got out of their experiments a number of chemical elements of a mass, or weight, about half way between hydrogen, lightest element, and uranium, the most massive.

Then, just as World War II was beginning, Lise Meitner, a German Jewish mathematician, made a clever calculation. She said that if the experiments were splitting an atom of uranium about in two equal parts, the enigma could be explained. She proved her point mathematically.

Dr. Niels Bohr, Danish physicist, who afterward escaped the Nazis to bring his atomic experiments to England and the United

States, learned of Dr. Meitner calculations. He broadcast them. Inside two weeks the physicists of Columbia University, Carnegie Institute, of Washington, Johns Hopkins, and other places, and of England and France had made the test and proved the German woman right.

Early in 1940, the task of isolating even an infinitesimal drop of the substance in pure form appeared hopeless. Toward the end of February, a minute fraction of a gram was isolated at the University of Minnesota physics department, directed by Prof. Alfred Nier.

The sample was rushed to Columbia University. Prof. John Dunning, who led the research team developing U-235, and I. E. T. Booth and Aristid V. Cronquist submitted the sample to tests via Columbia's 150-ton cyclotron.

About the same time at the General Electric laboratories in K. H. Kingdon and H. C. Pollock set up an apparatus similar to that of Prof. Nier. They separated a relatively large sample of U-235. This was submitted to the Columbia laboratory and corroborated the results obtained from the Minnesota sample.

The scientists found that with



a quantity of ordinary U-238 uranium was subjected to the bombardment of neutrons, which are particles of matter consisting of a proton and an electron closely bonded but with no electrical charge, very little energy was released. But when the new, rare U-235 was placed in the great machine, the oscilloscope screens and meters danced with amazing activity. They computed that each splitting atom of U-235 released 200 million electron volts of energy.

Translated into common terms this means that the energy released by one gram of U-235, which is about three one-hundredths of an ounce, equals about 11,700 kilowatt hours of electricity, or about five million times the energy produced by burning an equal weight of coal.

As an explosive, James R. Newman in his book, **Tools of War** (1943), estimated that one gram of pure uranium 235 is 10 billion times as effective as one gram of TNT.

Furthermore, the scientists found that it was not the high-speed neutrons produced by the cyclotron which shattered the atoms of U-235, but slow-speed neutrons, such as are thrown off

in the ordinary atmosphere of the earth by cosmic rays and common radio-active materials. This meant that while the cyclotron led to the discovery of uranium's amazing qualities it was not necessary to haul around any gigantic cyclotrons to ignite it in war or in peace.

At a meeting in New York in 1940, a group of scientists reported that this is what happens in the splitting of U-235's atoms (New York Times, May 5, 1940): There are 2,500 billion billion atoms in a gram of U-235. Each split of one atom releases 200 million volts of atomic binding-energy. The continuing split or 'chain reaction' of additional atoms by the neutrons released in the previous split is what gives U-235 its terrific power.

The scientists also stated that the 'burning' or explosive action of U-235 could be tempered by mixing it with larger proportions of regular U-238 uranium, the atoms of which cannot be split.

Emilio Segre, of the radiation laboratory of the University of California, reported in the **Encyclopedia Americana** (1943), that 'a good analogy to what occurs in uranium is a liquid vibrating drop.'

'If the amplitude of the vibration is increased beyond certain limits,' he wrote, 'the droplet splits into two fragments of approximately equal size. The atomic nucleus has some properties resembling those of a liquid drop, and the capture of a neutron, in the case of uranium, sets up violent vibrations which may lead to fission (splitting of the atom).

'The two fragments repel each other violently because of their electrical charges and a comparatively large amount of energy is released in each fission process. If we consider the possibility of disintegrating uranium on a microscopic scale, we come to staggering figures for the energy released.

'... It is obviously an extremely important question, from the practical point of view as well as that of the scientific investigator, to find a method of releasing the fission energy of uranium. In principle there is a simple method for doing this: In each fission process a few neutrons are emitted when the two big fragments fly apart. If these could be used to produce further fission, the process would go on and be self-sustaining until all the uranium

has undergone fission. . .'

When the atomic bomb struck Hiroshima, this is what happened: Uranium inside it was disintegrated by electrical means, and atoms dissolved into millions of particles, each moving at the speed of light, that is, 186,000 miles per second. The impact of such explosive force would generate incredibly intense heat. Bricks, steel, and concrete would be melted in a second and even soil itself would be destroyed by the fiery blast of unexampled power. Not a single human being would be left alive within a radius of miles, for the air blast alone knocks people off their feet at a distance 20 times as great as that for ordinary bombs.

Sir John Anderson, who supervised the research in England, says that the temperature generated by disintegration of the uranium bomb is probably higher than that in the center of the sun. Sand on the ground is turned into glass by the terrific heat when the bomb bursts.

Uranium is a lustrous white metallic element which does not exist in pure form in nature but comes from pitchblende, in the source of radium, or carnotite, a canary-yellow mineral found



sandstone.

Pitchblende deposits were discovered in 1930 at Great Bear Lake. There are both pitchblende and carnotite deposits in the United States. There is pitchblende in Britain, Austria, Russia, Sweden, and Norway. There is carnotite in Australia and Portugal.

One of the scientists who helped create the bomb, Dr. H. A. Wilson, professor of physics at Rice Institute, has advocated that 'some international authority should take control of the world's uranium supply to see that the mastery of the destructive principle of atomic disintegration does not fall into the wrong hands.'

What are the social consequences of this technological development in war and in peace?

In war—according to scientifically minded military men—armies, navies, and air forces have metaphorically been sunk in rubble and dust at Hiroshima.' (Gen. Carl A. Spaatz, United States Pacific aerial commander, has termed the new bomb 'the most revolutionary development in the history of the world.') Some are even going so far as to say that 'strategy will be unnecessary in future wars, for victory will depend on technicians alone.'

Writing in the Chicago **Daily News**, William H. Stoneman has stated: 'It is now evident that uranium explosives used in rockets and other guided missiles will make practically every weapon used until now look like a toothpick. It is suggested that great missiles of this type, employing a combination of uranium and heavy water as fuel and using uranium explosives in war heads, will be capable of destroying vast areas at a range equivalent to the circumference of the globe.'

The London **Times** has editorialized as follows: 'Science itself is neutral in the use of the vast power with which it has endowed mankind. It aspires to control the mighty forces of nature. But nations bent on war seek to make science their ally by enlisting men of science in their service. As the men of science, they seek only the truth, but as patriots in the hour of their country's danger they are legitimately called upon to deflect their researches as policy and strategy require . . .

'The fact that war in the future will be plainly suicidal will not prevent men from waging it. Consequently, so terrible a power must be brought under responsible control. If this can be done,

then before future generations will open up unimaginable vistas of material progress.

'The choice is literally one of life or death.'

The human animal cowers back from his glimpse of the future, bewildered by his dreadful dilemma. He wonders if science has put in the hands of man at last what he has so long heard about—but never thought would leave **Amazing Stories** or the Flash Gordon comic strips—the instrument of his own destruction.

Most scientists interviewed regarding the new development have cautiously stated that it may be a considerable period of years before the new power can be harnessed for peacetime use. However, the Duke de Broglie, an eminent French physicist, has said that the energy released by the invention 'seems to be destined fairly soon to replace coal and water power and to become the motive power of tomorrow.' He thought that it could only be compared to the discovery of fire by primitive man.

Some scientists see the development as the first step toward telephone booth-size heating plants for great factories and 1000-hour auto trips on one gram of fuel.

At the meeting in New York in 1940 (mentioned previously), scientists estimated that a block of five pounds of U-235, placed in a tank into which cold water flowed would produce enough steam to drive an ocean liner indefinitely over the seas of the world. The atoms of U-235, the scientists said, would not split until the water reached the block because the hydrogen atoms in the water slow down the neutron to a speed which is effective against the U-235 atom. The heat from this released energy would produce steam and all that would be necessary to control the quantity of steam would be to regulate the flow of cold water.

The well-known London correspondent A. C. Cummings, says of the peace potentialities of atomic energy: 'It makes scientists' wildest dreams come true for it places unlimited power at mankind's disposal. Coal mining will become obsolete, electric power plants unnecessary, gas line-driven automobiles out of date. The Queen Marys of the future may cross the Atlantic by the release of the energy in a single glass of water.

'Huge factories can be supplied with power from a unit of a few



square yards. Cities can be lit, provided with traction, and run by machinery at a cost that now appears fantastically low.

'All this is not scientific romancing, but plain unadorned scientific possibility.'

Politicians, economists, and business men are gasping at the news. Coal, oil, gas, and hydro-electric companies are anxiously assessing the possibilities. The public is thinking alternately about unemployment and a shorter work week.

William H. Stoneman has commented in the Chicago **Daily News**: 'The whole course of human relationships will ultimately be affected in drastic fashion by atomic power. With further developments, which may be accomplished well within our lifetime, sufficient cheap energy will be available to replace the productivity of countless millions of people.'

'Revolutionary methods will have to be adopted to prevent unemployment and stagnation from resulting.'

'Thus social science will be confronted with a problem as great as that solved, or in the process of being solved, by physical science.'

What is the reaction of Technocracy to the new discovery? What is its social significance in peacetime from the Technocratic point of view?

To Technocracy, the utilization of atomic power is the latest and greatest item in a long sequence of physical events which have been transforming this planet, particularly the North American Continent, during the last 150 years.

Technocracy has been studying the social impact of every scientific invention and technological advancement for the past quarter of a century. It has consistently pointed out that social institutions were lagging far behind physical developments. It made a scientific survey of the social effect of the consumption of extraneous (non-human) energy which indicated that when North America consumed 200,000 kilogram calories per capita per day (in peacetime) the present Price System could no longer operate.

North America was rapidly approaching that limit when World War II burst upon this planet. By dissipating vast amounts of extraneous energy on the battlefronts, the war made it possible for the Price System to survive.

But under the technological impact of total war this Continent stepped up its energy conversion to such an extent that we can now produce more than twice the goods—with half the men—than we did before the war. Even without atomic energy, the rate of conversion from North America's coal, oil, gas, and falling water would have made a complete change in our social control technic imperative and inevitable.

When the social mechanism of a Continental area steps up its energy conversion factor the goods and services that pour out in a flood must be consumed or destroyed. Under a Price System at peace they cannot be consumed because increasing use of extraneous energy has decreased purchasing power in displacing man-hours. The paradox of the Price System can thus be stated as 'the more we can produce, the less we can consume.'

North America is, therefore, faced with the problem of making revolutionary changes in her social system. Here are some of the major social changes that even our present technology will make necessary, and which use of atomic energy would make absolutely imperative:

1. Technological control over all natural resources and physical equipment.

2. A metrical medium of distribution based on an energy unit instead of a monetary medium of exchange based on value.

3. A work week that will shorten as more extraneous energy is utilized.

Every technological advance has been a bomb disintegrating the Price System structure. But to the average person it has been a comparatively slow and unspectacular process. Then, with the impact of the sun bomb, millions of citizens in dazzling flash have seen the black mountains of technological unemployment in the postwar period.

In the midst of the chaos and confusion caused by clinging to Price System methods in the Power Age, Technocracy goes calmly about its task, the only Organization in North America that is preparing to use scientific discoveries for the social welfare of mankind. Technocracy alone offers the scientists, technologists, and engineers an opportunity to do what most of them have always wanted to do: utilize our physical



equipment and energy resources efficiently so as to provide every citizen with security, abundance, and leisure.

Shortly after the end of World War I, H. G. Wells stated suc-

cinctly that man's problem was 'a race between education and catastrophe.' North Americans, which are you betting on as they come down the home stretch?

—Donald Bruce

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★ COULEE DAM, Wash., August 22—Power equal to the work performed by 8,000,000 men laboring steadily for 10 years was turned out by Grand Coulee Dam during the war, the Bureau of Reclamation announced today in telling how the world's greatest dam helped speed victory.

From the time that the first generator went into production on March 22, 1941, several months before Pearl Harbor, to the surrender of Japan on August 14, the power plant at Grand Coulee Dam turned out 15,767,474,000 kilowatt-hours of energy, said Regional Director Frank A. Banks of Reclamation. Great blocks of this power went to the famed atomic bomb plant at Hanford, Wash.

Translated into weapons of war, this production of more than 15 billion kilowatt-hours would equal 38,000 fighter planes, nearly 25,000 heavy bombers, or 70 first-line battleships costing \$80,000,000 each, Banks explained.

When the Japanese struck at Pearl Harbor, Grand Coulee Dam had only one of its massive 108,000 kilowatt generators and two small station service units in action. Today it has six of the 108,000's plus two smaller units of 75,000 kilowatts each which originally were intended for the Bureau's Shasta Dam in California. Government employees worked night and day, month after month, to hasten the installation of Grand Coulee's generators to serve major war plants in the Pacific Northwest.

Grand Coulee's war role recently received world-wide recognition when Army representatives stated that the availability of huge quantities of electrical energy provided by Grand Coulee Dam and Bonneville Dam helped make possible the production of the atomic bomb at Hanford. With its fellow plant on the Columbia River, the Grand Coulee power plant sent a steady stream of energy into transmission lines serving the secret project in southeastern Washington and thus enabled the United States to develop the most powerful weapon known.

★ IT IS QUITE TRUE that many of the world's ills may be traced back to changes introduced by technology. Our economic structure was not designed for today's production mechanism. No problems will be solved, however, by touching pleas for a return to the simple things of life. We can't put the clock back. Those who insist that it can be done usually arouse the suspicion that they are thinking in terms of an authoritarian state.

—JOSEPH MINDEL in *Tomorrow*

★ THE ESSENCE OF OUR INABILITY to cope with the problems raised by technology lies in an attitude of exaggerated laissez-faire. It is not that controls have failed but simply that they have not been applied. Our attempts at controls have a Victorian quaintness, charming, perhaps, in a period piece, but utterly out of place in the twentieth-century world.

—JOSEPH MINDEL in *Tomorrow*

# Science in the Social Field

*With World War II at an end the business man's paradise of almost universal scarcity begins to fade before a looming nightmare of over-loaded warehouses and mass unemployment. It now becomes increasingly apparent that the problem of distribution can be solved only by a unified application of science to the social order.*

WE are often told that we live in a scientific age. In the sense that we are dependent on applied science for the production and transportation of goods this claim is perhaps correct enough. However, while the methods of science and engineering are applied to the details of industry, the methods used in the over-all management of society—insofar as there is any management—are a hodge-podge of business expediency, legal tradition, pressure group jockeying, and departmental political bureaucracy. The scientist and the technologist are still, in this fifth decade of the Twentieth Century, the hirelings of business men and politicians; they are subject to a dictatorship of moneyed interests, the main objective of which (from the business man's point of view) is more and more business with higher profits, and (from the politician's point of view) maintenance of the status quo with as

little social change as possible.

The word 'science' itself has been kicked around so much that it has become almost meaningless—just a word that generally suggests test tubes and laboratories and weird-looking formulas. The universities, being citadels of tradition and repositories of dated ideas, still palm off on our unsuspecting youth as science much that should be relegated to the classification of academic folklore and forgotten: most of their economics and 'political science,' for instance, and much of their psychology. (As a side-light, we might note that this perennial hoax is financed largely out of our taxes). Carl Dreher, in his challenging book, **The Coming Showdown**, says, 'We are supposed to be imbued nowadays with the hardheaded, matter-of-fact spirit of science and technology, but it seems to me that much of what is offered in the field of science and political analysis is es-



essentially a kind of modern scholasticism, bearing no discernible relation to the world of reality and offering no intelligible prescription to those engaged in concrete problems.'

Technocracy proposes that the methods of science be applied to all the major phases of social operation. This proposal provides a short definition of Technocracy: 'science applied to the social order.' We are not concerned with science merely as a system of ideas on which to practise our mental powers, or as part of the stock-in-trade of the would-be intelligent person,' but as a methodology of social management, 'a way of doing things on a national or continental scale, a way of arriving at decisions in the social field.

The method of the scientist and technologist in solving problems is very different from the methods—or should we say, habits—of politicians, business men, mystics and lawyers, to name only a few. For example, if a technologist is faced with the problem of designing a cable for a suspension bridge he has to make a number of decisions as to size, length, materials, whether to use a single strand of solid metal or a wire

rope or a tube, and so on. He does not solve the problem by submitting it to a vote of the general citizenry, as would the democratic politician; he does not solve it by deciding which way will make the most money, as would the business man; he does not go into a trance or a prolonged fast to induce visions, as would the mystic; he does not pore over old books to find the answer in a pronouncement by someone in a high position, as would the lawyer. No, his decision is based on the requirements of the job and the physical factors involved. He measures very accurately the length of span required; he knows what weight his bridge is required to bear and what wind stresses it must sustain. He calculates what tensile strength his cable will have to have; he finds out what materials are available. Then, making allowances for all the physical factors that enter into the problem, he decides on a certain size and design of steel cable.

Enlarging the scope of our example to take in the whole bridge, the problem then is how most efficiently to build a structure that will sustain a certain weight of mobile traffic under all condi-

tions of climate that obtain in the locality. Every detail of the design, down to the size of bolts holding the gusset plates, is determined by its relation to the whole; and, moreover, the requirements in each case can be stated in so many units of measurement.

If we enlarge the problem still further to take in a whole national transportation system the same general procedure can be followed out. That is, we decide what the over-all requirements of the job are (just as we might decide that a bridge should be required to carry a load of 160 tons under stated conditions); then we design our system with these basic requirements as the dominant criteria for deciding the design of each individual detail. The reason this method is used in the world of technology is simply that it works, where other methods fail. If oil companies could reliably decide where to drill for oil by employing diviners or Hindu swamis they would certainly do so, in preference to using intricate and expensive seismographic survey equipment and drilling test holes at a quarter of a million dollars or more per hole.

As individuals, scientists are as

different personally as any other grouping of human beings. Take a few at random—Darwin, Helmholtz, J. B. S. Haldane, Madame Curie, Steinmetz, Einstein—and you have as wide a variety of personal temperaments as if you named off-hand half a dozen Hollywood actors or mayors of New York. But the work of the scientists is divorced from their individual preferences and notions; however their personal characteristics may differ, their methods follow a general pattern not as a matter of tradition but as a necessity.

First, the scientist or technologist, whether in the laboratory or in the 'field,' collects the facts relative to his problem. It is important that he should get all the facts available. He knows that if he omits any important fact in his investigations his conclusions will be wrong, and he can probably call to mind several cases where such omissions have led to failure or even disaster. He knows, for instance, that the presence of mosquitoes in Panama was an important factor in the history of the construction of the Panama Canal—as de Lesseps learned to his cost.

Much of the accumulation



cts can be gained indirectly; that is, the facts have already been established. The bridge designer can find the shearing strength of a  $\frac{3}{4}$  inch rivet from a steel catalogue without personally conducting tests; the hydraulic engineer can find by consulting a table that a head of 300 feet will produce a hydrostatic pressure of 10 pounds. Many problems can be solved without any direct investigation, because the engineer and scientist have a vast heritage of accumulated knowledge stored in technical books and periodicals. Many facts not obtainable from such sources must be established by observation and experiment. Having collected all the relative data he can, the technologist then makes his analysis of the problem, which may take the form of a written report. On the basis of this he makes his synthesis, or in more familiar terms he decides how he is going to do the job and draws up his plans and specifications. But that's not the end of his job. Construction work or fabrication begins, in the course of which he may have a number of operational problems to solve, as when a tunnelling project runs into unexpected quicksand or a seam of unusually

hard rock. And then, in such processes as machine manufacture or airplane construction there is the task of working out the 'bugs,' which is sometimes a long drawn-out affair.

It should be noted that the operations we are considering are mostly matters of measurement. Moreover, the measurements are all expressed in non-variable units. A pound weight has a very exact meaning and does not fluctuate with a change from a Liberal to a Conservative government. There may be inflation of the pound Sterling but there is no inflation of the pound weight. The length of a metre was established in 1799 and has been exactly the same ever since and will be the same a thousand years from now. This non-varying character of units of measurement is an indispensable prerequisite of science. It automatically excludes from the field of science such mental pursuits as philosophy and economics, important as these may be as phases of the mental gymnastics of the traditionally 'well educated' person.

Commerce is based on monetary values, which are expressed in dollars; but what a dollar is

has never been quantitatively defined, and never can be. Consequently the monetary value of anything can never be established: it remains forever in a vague never-never land in whose insubstantial atmosphere the scientist cannot live—as a scientist.

Pick up a simple object such as a brass ash tray and send it to the National Research Council for investigation. They can give you a lot of information about it: its weight, metallurgical composition, electrical conductivity, coefficient of expansion, specific heat, and many other properties, each of them expressed in a certain number of this or that non-variable unit. But ask them the value of it and they are lost. Even if you sent it to the Department of Economics at a university, the professors could not hazard a guess about it until you told them whether you meant its value today or four years ago or forty years ago, whether you meant in an Eskimo village in Labrador or a department store in Montreal or a scrap metal agency in Moose Jaw or in Berlin in September, 1923. It is notable that in the ascertaining of the physical properties of our ash tray it doesn't matter whether

we send it to Russian scientists in Moscow or to the University of Cambridge or the Bureau of Standards in Washington. We would get the same answers in each case; and if we repeat the investigation twenty years from now we will still get the same quantitative data for each property.

The world of the scientist is the objective world. He looks outward, not inward. As an individual he may have other interests which come within the range of the subjective. Sir Oliver Lodge, an eminent physicist, was perhaps best known to the public as a spiritualist. Mendel spent most of his life in monasteries. Einstein's biography of her mother gives us a rich warm story of a young girl, an affectionate wife and mother, as well as recording the career of a great investigator of the phenomena of radioactivity.

Still, as scientists, each of them was concerned with the objective world of reality, a world in which statements can be verified or rejected by reference only to phenomena which can be measured some way. Max Planck, the great authority on thermodynamics

*(Continued on Page Thirty-five)*



OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN

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## *The Story of Pulp and Paper*

PAPER manufacturing began in Canada early in the past century. The first mill in Lower Canada was established at St. Andrews, near Lachute, in 1803, and the second in the county of Portneuf in 1810. The Maritime Provinces entered the industry in 1819 with a mill built at a little distance from Bedford Basin, near Halifax. The first mill in Upper Canada was located at Crooks Hollow (now Greensville) near Hamilton, but the date is uncertain, being set by some at 1813 and by others at 1820 and 1825. At the census of 1851 Upper and Lower Canada had five mills each, and ten years later Lower Canada had six and Upper Canada five.

Until Confederation the industry was confined to the manufacture of paper from rags. Prior to 1860 no wood-pulp was used or produced anywhere. The supply of rags for paper-making is distinctly limited and the material soon became too expensive for the manufacture of cheap paper. Paper-makers experimented with fibres from the stems, leaves and other parts of numerous annual plants; but the small proportion of paper-making material recoverable from such sources led to experiments in the use of wood. Different species were tried, and finally spruce, balsam and hemlock were found to

be the most suitable for manufacture of paper of the average grades, although in recent years increasing quantities of jackpine and poplar are used. Rags are still used for certain fine papers.

In 1886 Alexander Buntin installed at Valleyfield, Quebec, what is claimed to have been the first wood grinder in America and began the manufacture of wood-pulp by the mechanical process. About the same time Jacob Thomson was successful in his experiments to manufacture paper from wood by using caustic soda to dissolve the non-cellulose components, and his employers built the first chemical wood-pulp mill in Canada at nearby Windsor Mills, where production began in 1869.

These two pulp-mills, however, are not mentioned in the census of 1871, which covers only the 21 paper mills in operation, 12 located in Ontario, 7 in Quebec and one each in New Brunswick and Nova Scotia. These paper mills had 760 employees, distributed \$197,815 in wages and salaries and produced paper valued at \$1,071,651. Ten years later, in 1881, there were 36 paper and 5 pulp-mills in operation with a total of 1,588 employees, a pay-roll of \$460,476 and an output valued at \$2,509,993 consisting of pulp valued at \$63,000 and paper valued at \$2,446,693.

During the next decade the use of wood-pulp in paper-making was extensively developed and in 1887 Charles Riordan installed the first sulphite mill in Canada at Merritton in the Niagara Peninsula. The census of 1891 shows only a slight increase in paper production but the number of pulp-mills had grown to 24, of which 17 were located in Quebec, 3 in Ontario, 2 in Nova Scotia and one each in New Brunswick and British Columbia, and the annual value of the products amounted to \$1,057,810. Although one pulp-mill was credited to British Columbia, it was not until 1909 that pulp was manufactured from wood in that province; however, a paper-mill using rags imported from Great Britain was operated near Alberni from 1894 to 1896.

At the beginning of the present century the output of the pulp and paper industry of Canada exceeded eight million dollars. From then until the end of the first Great War the industry increased rapidly and steadily. In 1907, the Brompton Pulp and Paper Company



many built at East Angus, in the Eastern Townships, the first mill in America to produce chemical pulp by the sulphate or kraft process. Many new pulp and paper-mills began operations in the Maritime Provinces, Quebec, Ontario and British Columbia.

It was during this period that the paper industry began specializing in the production of newsprint. Reduction of the American tariff on newsprint in 1909 and a few years later the removal of all duties on this commodity hastened the migration of the American newsprint industry to Canada. In 1918 production of the pulp and paper industry reached well over 100 million dollars.

Following abolition of price control, imposed toward the end of the first Great War, the price of pulp almost doubled, and the gross output of the industry reached a peak of \$236,420,176 in 1920. From 1922 to 1929 there were steady annual increases in the total value of production culminating in 1929 in a figure of \$243,970,761. There were annual reductions during the next four years, but the output rose again to \$208,152,295 in 1939. In that year there were 7 mills making pulp only, 49 combined pulp and paper-mills and 24 manufacturing paper only, a total of 100 mills.

Besides the many new mills built during the 1939 period, most of the older ones added new paper machines, grinders and digesters and other equipment. In 1939 the pulp and paper industry had a daily capacity of 12,956 tons of groundwood pulp, 6,800 tons of chemical pulp, and 14,714 tons of paper. In 1939 the pulp and paper industry occupied first place among all manufacturing industries in Canada in respect of amount of capital employed and amount of salaries and wages paid. In number of employees and gross value of production it stood second to the sawmilling industry, and the non-ferrous metal, melting and refining industries respectively.

During the earlier years of the present war the manufacture of wood-pulp and paper increased by leaps and bounds. The exceptional demand for pulp made necessary the installation of additional manufacturing facilities. In 1940 and again in 1941 both volume and value of production exceeded all previous levels. In 1942 and 1943 the gross value of products increased still more, but the volume of pulp and paper produced was somewhat lower than in 1941. Two factors

accounted for this decrease in production: the urgent need for men for war industries and the armed services reduced the supply of man power available for cutting pulpwood in the forests; and the production of munitions and other war materials necessitated the diversion to new war plants in eastern Canada, and in New York State of part of the hydro-electric power used in pulp and paper manufacture and the consequent reduction of the output of certain mills.

Despite these handicaps the Canadian pulp and paper industry supplied to the United Nations tremendous quantities of pulp, paper and pulp and paper products, so essential for the successful prosecution of the war. The use of the products of this industry for direct war purposes may be less obvious than in some other cases, but they are many and varied.

Wood-pulp is used extensively in the production of high explosives, such as cordite and gun cotton, replacing cotton linters about half the cost. From the same wood, cellulose surgical dressing and hospital wadding are made to heal the wounds of the soldiers. The so-called 'dissolving' pulps are also transformed into rayon, cellophane, cellophane and pulp-based plastics from which are produced synthetic yarns for tires and parachutes, gas-impervious clothing, impervious wrappings for intricate machines, wrappings for perishable drugs, chemicals and food, housings for radio, aircraft, artillery and navy instruments, etc., replacing cotton, silk and metals.

Paperboard is used in containers for shell cases, ammunition, gun barrels, machine parts, blood plasma, food and medical supplies, replacing metal and wood. Building board or wallboard replaces lumber in the construction of barracks, hospitals and other temporary buildings and for the finishing of ships, ambulances and aircraft.

Certain paper products are component parts of sea and land mines, of radio equipment, of shells and other weapons of war. Much wall kraft paper sacks have replaced jute sacks in many instances. It takes three acres of blue-print paper to put into production a single bomber type of aircraft. The armed forces and the munitions industries require much paper for administrative use.

Newsprint is indispensable for the dissemination of information and the maintenance of a free press in over forty countries has



ended chiefly on the output of Canadian newsprint mills. Millions of leaflets were dropped on the enslaved countries of Europe. Large quantities of papers are required for the production of ration books, Victory Bonds, War Savings Certificates, etc., etc. Other kinds of paper, such as wrapping paper, tissues and special grades are also essential.

A special contribution to the general war effort was made by the pulp and paper industry by the adoption of a program of 'bits and pieces' in its extensive and well-equipped machine shops, and the diversified list of products made includes parts for naval and cargo vessels, aeroplanes and gun-mountings, as well as gauges and other special devices. During the first year supplies produced were valued more than \$1,250,000, and subsequent production has been much greater, the amount received for such work in 1943 reaching \$2,012,165, which represents only a fraction of the value of the finished products, most of the materials used being supplied by the customer.

In the early years Canada exported the products of her forests in the raw state, but through the development of her own mills and the use of new processing methods, the great bulk of Canada's forest exports, particularly in the line of pulp-wood and paper, became fully manufactured. In 1943 the United States took 78% of bleached sulphite exports; 82.3% of sulphate pulp; 80.8% of mechanical pulp; 1.9% of screenings, and all the other pulp. Other countries which have figured in Canadian exports are the United Kingdom, Brazil, Mexico, Australia, Columbia, Peru, Portugal, Eire, Uruguay, and the British West Indies.

The importation of paper is relatively unimportant in comparison with exports but it is far from being an inconsiderable item. It amounts to \$7,520,328 in 1938 and to \$10,701,736 in 1943, forming about 6% of the value of the exports of paper in both years. The United States provided practically all such imports in 1943. The greater part of her importation is made up of paper, paperboard or paper goods which have been subjected to some special process to fit them for a special purpose or consists of finished products manufactured from paper or paperboard.

Almost every class of paper or paper goods at present imported

into Canada is being made in this country or could be made with comparatively little change in the equipment existing in our paper-mill and the plants of our paper-using industries, providing there were sufficient demand to warrant such manufacture.

Canada possesses abundant supplies of the raw material on which the pulp and paper industry depends. The forested area of Canada, estimated at 1,220,405 square miles, is exceeded only by the forests of the Union of Soviet Socialist Republics and of Brazil. The productive area alone is given as 770,565 square miles.

According to the latest calculations of the Dominion Forest Service, the total stand of timber in Canada comprises 1,941,076,000 cords of small coniferous material, a large part of which is suitable for making into pulpwood. Of this total 1,082,879,000 cords are present accessible. The Eastern Provinces, in which the pulp and paper industry is concentrated, account for 803,128,000 cords of the small material and British Columbia is credited for 186,286,000 cords.

If wise policies are adopted to reduce wastage through fires, insects and tree diseases, and to encourage good forest management in general, the Canadian forests can provide the raw material for large scale production of pulp, paper and related products in perpetuity.

This country's position in the matter of hydro-electric power, which is also essential for the success of the pulp and paper industry, is just as favourable. Available waterpower at ordinary minimum flow was estimated at 25,439,000 h.p. as of December 1943; at the same date, the total turbine installation amounted to only 10,214,500 h.p. The pulp and paper industry is already the largest user of hydro-electric power in Canada; before the war it consumed about 40% of the total for all Canadian manufacturing industries. Should the industry's requirements increase, there are still large sources of power to draw from.

Not only is Canada endowed with tremendous forest reserves and huge hydro-electric resources, it also has a well-organized industry to utilize these riches. The pulp and paper-mills of Canada are advantageously located across the country, near both Pacific and Atlantic seaboard, and consequently are in a position to make economical deliveries to any part of the world. In 1943 these mills had a daily



capacity of 7,599 tons of chemical pulp, 13,414 tons of mechanical pulp, 15,465 tons of newsprint and other paper and 1,722 tons of paperboard.

—Dominion Bureau of Statistics

EDITOR'S NOTE: *A modern social system directed by scientific and technological control will change the status of the present pulp and paper industry.*

## Technology Revolutionizes Farming

IN THIS article, a few of the more outstanding achievements of farm industrial enterprise are touched on, some of the plans for tomorrow dealt with. Both are of almost revolutionary magnitude.

Here is what has happened to output per man on the Canadian farm — and this includes all types of farm operation, not just the harvesting advances dramatized on the next page. The index was compiled by Dr. E. C. Hope, formerly of Saskatchewan University.

### Index of Farm Output Per Man

1921 .....	66.7
1928 .....	84.8
1931 .....	71.6
1939 .....	105.4
1942 .....	167.5

The first 20-point jump coincides pretty generally with the introduction of the tractor-drawn combine; the last 62-point rise reflects the effective use of farm manpower after about 400,000 farm workers went to the armed forces and war industry. Again, a major part of the story was broader use of machines.

In the illustration (on the next page) is told the story of the mechanization of the harvest, on large-scale grain farms. This 16-fold increase in efficiency is the most dramatic aspect but the effects of mechanization are wide-spread. Some examples:

**Milking:** a hand milker milks 7-9 cows an hour; with a milking

# Technology Boosts Farm Output

—In 19 short years the daily output of a man on a farm has increased to about 17 times what it was. Here is the daily output of a harvester: first, as part of a team which reaps, binds, stooks and threshes in three operations with the aid of horses and a tractor; second, working with another man and a tractor-drawn combine, which reaps and threshes in one operation; third, driving one of the new improved, self-propelled combines. Figures refer to acreage harvested per man in a 10-hour day by each method.

**1920**  
**3 acres**



**1926**

**20 acres**  
per man-day



Harvest team

Tractor-drawn combine

**1939**

**50 acres**

per man-day



Self-propelled combine



machine he does 20.

**Corn-husking:** by hand, 6½ hours for an acre; with a one-row picker, 1½ hours.

**Sugar Beets:** (blocking, thinning, lifting, topping, loading); by hand, 72 hours per acre; with a machine, 12 hours.

**Transplanting Sweet Potatoes:** by hand, 42 man-hours for an acre; with a transplanter 10.

But in spite of past advances, experts say the possibilities of increasing labor efficiency in agriculture are still vast. The farm implement industry is gearing up for an accelerated increase in the use of power machinery, as supplies become available.

What's ahead in the line of farm machinery? Weight and durability have already been greatly improved. But through heat treatment of steels and other alloys, through the use of plastics through exploration of the effect of grain structure and fibre and how it must be handled to get the greatest use from the smallest amount of various materials — greater strength and lightness are expected.

Comfort and appearance will rate more attention in the post-war world; easier operation and noise reduction are under study; streamlining and color innovations are in the wind. But these considerations will still run second to greater efficiency and more speed — the kind of improvements that reduce the farmer's cost of production. By study with farmers under actual conditions engineers are learning more and more about what the farmer really wants and needs.

'Integration' of tractor and implements is an important trend expected to be emphasized after the war. This may be developed in two directions:

1. Through the increased use of self-propelled machines;
2. By increasing the ease and directness with which machinery or implements may be attached to the tractor. For instance there may be, on the smaller self-propelled machines, a small light-weight demountable engine so that one power unit will do for all machines.

The self-propelled combine is expected to be in great demand as soon as it is available for sale again. It was introduced a few years before the war, but had hardly got into its stride when war production took priority. It has only one engine and one operator —

therefore is said to be much more economical than the conventional tractor and combine which has an engine and operator on each. A further saving of at least half a bushel per acre in opening up fields for harvesting, is claimed for the self-propelled machine, which has no tractor in front of the cutting knives to run through the standing grain and beat it down beyond recovery.

Tractors are now owned by slightly more than a fifth of the farmers in Canada. Ownership increased over 50% between 1931 and 1941. A large new market, in addition to the replacement market, is believed to be waiting for tractors, though further adaptations may be required before tractors can be used on some of the types of operation classed as 'farms' in Canada.

Researchers expect greater power output, lower fuel consumption and generally improved engine performance from the tractor in the future — which should lower the cost of production with power machinery.

Not all the new developments are in the familiar tractor and combine. Here are some of the other new wrinkles the war-working implement and machinery industry has up its sleeve. Many more are on the drafting boards.

The forage crop harvester cuts and chops silage crops in the field and loads the chopped products into the wagon to be hauled to the silo. One of these machines does the work that would normally be required of a mower, rake and loader. It can also be used to chop and pick up combine straw.

The automatic tying pick-up hay baler, pulled by a tractor, travels along the windrows of hay, gathering it up, pressing it into bales and discharging the completed bales.

A rotary tiller is also being developed which is said to do the work of plowing, discing and harrowing in one operation.

A combination fodder-sprayer, fire-fighter, paint gun and insecticide dispenser has been proudly reported by a U.S. company recently. This machine can spray a 20-foot swathe of nourishing but unpalatable grass with a molasses solution which will lure finicky cattle into eating it with relish, according to reports. Filled with the appropriate mixture, it becomes in turn a weed or insect sprayer or a paint gun.



It can also be used to fight fires on the farm with a liquid fog.

A development which may lead to others of the same nature is a mechanical device for loading potatoes, in districts where potatoes are packed into barrels. This job used to require a four-man crew; one to drive the truck, two to lift the barrels to the truck and another to stack them. The barrels weigh around 200 lbs. and must be lifted a vertical distance of about 32 to 36 inches. With a hydraulic barrel loader mounted on a truck and operated by a gas engine, two, or at the most three, are all the workers required—and the job is a lot lighter.

Still in the development stage, but expected to get into use fairly soon, are improved machines for loading manure, cleaning stables, crop unloading, grinding. As rural electrification proceeds, the tractor-mounted diesel electric set (used freely in World War II) may be adapted to perform certain farm functions. —**Financial Post**

*EDITOR'S NOTE: Farms in the New America of science and technology—the Technate—will be agro-technological units of 400,000 acres or 25 miles square. A study of this unit is highly interesting when compared with our present farming methods.*

## *The Outlook for Chemicals*

NO ONE would have ventured to suggest in 1918 that the huge stocks of explosives with which chemical firms were bulging would ever be anything but a liability. But when manufacturers began to look for ways to dispose of their stocks, they found, not only a solution, but a whole new industry: the manufacture of nitro-cellulose lacquers.

These new, glossy, inexpensive stepchildren of war penetrated many other industries: automotive, construction, packaging, for examples. Costs were reduced and consumer appeal heightened all along the line.

During this war, the chemical industry's expansion has been even greater; and its search for new products is even more pain-

staking. Other industries, this time realizing how vitally they may be affected by what the chemical industry does to solve its own problems, are watching the chemists closely.

This article sketches briefly some of the chemical developments most likely to affect Canadian industry after the war.

Not all of these significant developments are among the spectacular discoveries and applications that have been displayed to the public over the last 10 or 20 years, such as penicillin, sulfa drugs, plastics, vitamins, synthetic fibres, DDT, synthetic rubber.

Behind these products that touch the consumer directly are more fundamental advances without which plastics, sulfa drugs and so forth might never have been possible . . . developments that provide a general cost reduction open up whole new lines of endeavor. A leading chemist describes three of the most important of these, typical in their impact of industry as a whole, which have occurred over the last 50 years:

'They are, perhaps, disappointingly unromantic. Two of them concern sulphuric acid and nitric acid. These might be said to bear the same relationship to chemical industry that steel and concrete do to structural engineering.

'Until the development of the so-called "contact process," sulphuric acid was made in chemical plants that were large and expensive in relation to output. The more concentrated forms of sulphuric acid increasingly demanded by industry were still more expensive to produce. By the contact process sulphur dioxide and oxygen are made to combine in the presence of platinum, almost instantly, to produce sulphur trioxide. This, when dissolved in water, gives sulphuric acid. The development of this process gave industry an unlimited supply of sulphuric acid of any desired strength at low cost.

'Somewhat similar has been the story of nitric acid.

'Large deposits of nitrates in Chile were formerly the chief source of the nitric acid that chemical industry requires in great quantity. Nitrates contain nitrogen, the gas that constitutes four-fifths of the air we breathe; but formerly it was impossible to make the nitrogen of the air react chemically. Now, there are two processes by which this can be achieved: in one, it is made to react with the oxygen also



present in the air, to produce oxides of nitrogen (which when dissolved in water give nitric acid). In the other, it is made to combine with hydrogen to form ammonia. The latter may be readily transformed into nitric acid. In both of these cases and in the case of sulphuric acid also, "catalysts"—materials which by their presence speed chemical reactions—are used. This use of catalysts has, in itself, been one of the most interesting and widespread developments of the chemical industry.'

The third development chosen by this authority was the development of a language: the terms of organic chemistry, that branch from which stems all our foods, all textiles, paper, most drugs, leather, rayon, rubber, petroleum and its products. 'We can see, looking back,' he says, 'that a knowledge of how these comparatively complex chemicals are put together in nature, and the development of a system of picturing their structure and naming them, has been responsible, more than any other single factor, for the mushroom growth of their part in the science of chemistry. This has enabled materials found in nature to be duplicated in the laboratory, but—far more important—it has made possible the manufacture and development of hundreds of useful materials not found in nature.'

It is possible, according to another leading chemist, that two major Canadian industries may be revolutionized, one by a recent chemical, or rather technological, discovery, and the second by the result of our war effort. The lumber industry, he says, will undoubtedly feel the impact of the new techniques of hardening wood by plastic or chemical impregnation, and of bonding sawdust or plywood with thermo-setting resins. Soft woods may thus be used to a greater extent as building materials.

The second revolutionary development anticipated by this authority, arises directly out of the war. Our new ability to produce ammonia, sulphuric acid, phosphoric acid, greatly exceeds Canada's former consumption of these chemicals. Canadian farming is likely to benefit through lower cost fertilizers, while the pulp and paper industry will also probably be affected.

One of the first and greatest wartime expansions in Canada was in the production of ammonia, nitric acid, and ammonium nitrate.

Ammonia, if secured cheaply enough, could supplant the lime and limestone now employed as one of the chemical components for the digestion of wood to sulphite pulp. Cost is the only thing that would prevent its large scale use, but there is hope for the desired low cost in postwar years.

When the war began, Canada was producing less than 100 tons of ammonia a day. Now our production can be over 500 tons. Three large plants were built by the government, one at Niagara Falls, one at Trail and one at Calgary. The initial purpose of these plants was to supply nitric acid for nitration in various explosive processes, and for the production of ammonium nitrate (which when mixed in various proportions with TNT yields the shell and bomb-filling explosive, known as amatol).

In peacetime, ammonium nitrate is of great use, not only as a chemical for further processing, but also as a nitrogen-carrying fertilizer. Ammonium nitrate when pure contains 35% of fixed nitrogen. When properly processed with derivatives of calcium cyanamide it plays an important part in the production of valuable artificial resin bodies.

The impact of chemical developments on industries is complex, operates in several directions at once. For example, the development of plastics and the synthetics will probably have marked effects on the metallurgical and glass industries.

Taking a look at the future, one research manager says: 'Most process industries have research departments possessing many important chemical discoveries as yet undeveloped commercially. Many postwar factors, such as aggressive commercial exploitation of present discoveries, public acceptance of the products, public purchasing power and certain other factors control the rate of commercial development of new products. As present discoveries are commercialized it is necessary for industry to spend more and more on research in order to keep their backlog of discoveries and developments sufficiently ahead of immediate requirements.'

The Department of Finance has recognized the importance of commercial research to provide a source of expansion for business today. Out of this general acceptance of research's importance has



come, however, one sentiment that rather irritates the chemist: the feeling that chemists can supply the answer to all our problems, from what to do with our wheat surplus to how to banish disease. Chemists roundly denounce such assumptions as 'sensational,' stress the years of patient effort that have brought chemical knowledge to its present pitch, stress also the major social, political and economic influences that pounce on a chemical development as it emerges from the laboratory. Chemists have pointed out, in fact, that if all further progress in scientific discoveries were stopped, and if the results already obtained could be properly applied and the results made available to humanity, a very nice approximation to the millennium might be obtained.

In spite of their desire to be cautious, to raise no hopes they cannot fulfill, many chemists will agree that from their labors may come some if not all the wonders we have learned to expect.

'One cannot, of course,' says the chairman of the chemistry department of a major Canadian university, 'say specifically what the next 10 years hold in the way of developments in chemistry that will affect our daily lives, but one trend seems clear. In the past we have taken the materials with which nature has supplied us and adapted them as best we could to our needs. These adaptations have sometimes been chemical, sometimes physical, and sometimes an adaptation of both. The products so obtained have not necessarily been exactly suited to the purposes to which they have been put. That is, in the past one has been faced with a given set of specifications and has sought the material best suited to them. In the future we may expect, within reasonable limits, that a material can be made to suit a set of specifications.'

—The Financial Post

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PRODUCTION by Canada's chemical industries reached an all-time high in 1943, according to a final summary released by the Dominion Bureau of Statistics at Ottawa. The official figures place the value of chemicals and allied products for that year at \$765

millions, which is 52% more than in 1942 and more than five times the best pre-war total for this group of industries. However, a large part of this gain can be attributed to higher returns from shell-filling plants which are classed in this group in the official records. Without these works the over-all increase was about 8%, a figure which is probably much more representative of the general trend in the chemical field. Nine of the industries in the group showed higher output values than in 1942, the percentage advance being as follows: heavy chemicals, 20.3; compressed gases, 12.3; fertilizers, 28.2; medicinal, 20.9; toilet preparations, 27.1; adhesives, 23.9; polishes, 4.8; and miscellaneous, 91.8. There was a decline of 1.5% in paints, 2.9% in inks, 2.3% in wood distillation, and 3.9% in coal tar distillation, while values for soaps and cleaning preparations are practically the same as in the previous year.

In the entire group there were 945 establishments in operation representing an investment of \$759 millions in fixed and working capital and giving employment to a monthly average of 92,288 workers during the year. These firms paid out \$147 millions for salaries and wages, \$368 millions for materials for processing and \$18 millions for fuel and electricity. Compared with 1942, the increase in capital was 61.1%; in salaries and wages 9.2%; in cost of materials 53.7% and in value of production 52.5%. About 44% of the production in 1943 was from Ontario with 484 establishments and output value at \$338 millions. Quebec, with 310 factories and production worth \$372 millions, accounted for 49%, and British Columbia with 6 plants and output at \$28 millions accounted for 4% of the total. Imports of chemicals and allied products amounted to \$70.5 million in 1943 compared with \$66.8 millions in 1942. Exports increased to \$86.4 millions from \$77.3 millions in 1942.

#### —Agricultural and Industrial Progress in Canada

★ IN 1920 there were 297 industrial research laboratories in the United States staffed by approximately 7,400 technically trained men. This number rose to 1,050 laboratories and 19,000 men in 1927; 1,520 laboratories and 33,000 men in 1933 and 2,350 laboratories with 70,000 chemists, chemical engineers, physicists, biologists, chemists, bacteriologists, etc., in 1940.

—R. C. SWAIN, RESEARCH DIRECTOR, AMERICAN CYANAMID CO.



(Continued from Page Eighteen)

es, said that to the scientist 'only that which is measurable is real.' This may at first seem too restrictive a generalization; but you will search a long time in the physical world before you will find something that is not measurable in one way or another. The astronomers tell us that there is helium gas in the sun. They have never been able to weigh it or get a sample of it or even see it. Its existence is known only from the fact that the spectrograph of the sun shows a clear band corresponding to the same band in the spectrum of other iridescent gases which are known to contain helium. This is a measurable effect,' and brings the matter of helium in the sun within the field of the scientist.

In contrast, the philosophical idea that animals have souls, though it might interest you as a question for speculation, and might be welcomed by a college debating society as a subject for their weekly tug-of-war, is nevertheless outside the scientist's sphere of investigation because no mathematical notation of any kind can be made of manifestations of such an entity. The scientist does not deny the existence of souls in

animals; he just leaves the whole question to others and goes on with his work.

Since the findings of science are the results of verifiable measurements made in the real world, it follows that science is not authoritarian. In the middle ages any question as to the real world was referred to the classical philosophers, chiefly Aristotle. Their pronouncements were final and if their writings said nothing about it it could be classed as unknowable, and forgotten. If a statement **had been** made (such as that the Earth is the centre of the universe) then anyone who questioned the overwhelming wisdom of the ancients was a fool or worse. But in modern times all scientific statements are open to refutation by anyone at any time. One of the most tenacious concepts of the eighteenth and early nineteenth centuries, the caloric theory of heat, was invalidated by the work of three relatively obscure men—Mayer, Joule and Helmholtz—who were none of them professional physicists.

The acceleration of gravity at the surface of the earth is stated in the physics textbooks as 32 feet per second per second. This was not established by edict or by

legal authority, like the price of sugar, or by tradition, like the color of Judges' gowns, but is simply observed in nature. The use of copper or aluminum wire in electrical transmission is not the result of one group or another winning a debate in a legislature; it is just a matter of the tensile strength, conductivity, durability, etc., of various available substances, an example of a decision dictated by the physical factors and not by political or legal manipulation.

Technocracy points out that in North America in this day and age the end of an era is right ahead of us, an era of scarcity and hand toil, in which business direction of production and distribution has been able, by such devices as government pump-priming, huge foreign loans, unemployment relief and wars and rumors of war, to stave off the problems arising out of modern technology. In that past era distribution has never been a designed operation; it has always been a haphazard scramble, with big business wielding the heaviest club, aided and abetted—in exchange for varying degrees of social security—by a motley following of politicians, pressure

group spokesmen, press men, the 'legal fraternity,' economic medicine men, and a host of chiselers, big and small, operating within or outside of the law.

But now, with the war over, the business man's paradise of almost universal scarcity begins to fade before a looming nightmare of over-loaded warehouses and mass unemployment. It becomes increasingly apparent that, as Technocracy has steadfastly pointed out, the problems of distribution created by applied science will be solved only by a unified application of science to the social order.

Scarcity is not a mere accident of business operation; scarcity is the very air that business breathes. You can't sell to a glutted market, and every business man knows it. That means that distributing abundance is not a job for business. It is a job of social engineering.

In the years immediately ahead of us the realization of the statement will be forced on the people of this Continent by the demonstrated inability of business to distribute to the general citizenry the goods and services which they themselves produce.



The alternative then will be scientific distribution, in which the process of getting the products of North American factories into use by the people will be integrated with the actual production schedules in a unified over-all design. The general specifications or that job have already been

drawn up.

This generation of North Americans will be forced to break from the past era of scarcity and business; they must unite in a vast engineering project and live in the new era of abundance made possible by applied science.

—W. A. Adam

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MODERN CEMENT-MAKING is an industry, really an art, which was lost for ages but rediscovered in the middle of the 18th century by the famous Scottish engineer Smeaton who built the first Eddystone Lighthouse that withstood the stress of wind and sea. The Egyptians, the Carthaginians and the Romans all knew about cement and used it. The Pyramids are a proof of this fact. When the glory of Rome faded, cement-making seems to have vanished utterly and later builders were not allowed to duplicate the enduring structures of the ancient architects until Smeaton, looking for some substitute for lime mortar which would set hard under water, hit upon it by burning impure limestone mixed with clay. Portland cement first appeared in 1824. An English stone mason, Joseph Aspdin, made it. His cement was called Portland because it bore a fancied resemblance to building stone quarried on the Isle of Portland. The production of Portland cement in Canada in 1943 amounted to 7,302,000 barrels, as compared with 4,509,000 in 1936 and 12,284,000 in 1929.

—DOMINION BUREAU OF STATISTICS

IN 1886 ALEXANDER BUNTIN installed at Valleyfield, Quebec, what is claimed to have been the first wood grinder in America and began the manufacture of wood pulp by the mechanical process. About the same time, one Jacob Thomson was successful in his experiments to manufacture paper from wood by using caustic soda to dissolve the non-cellulose components, and his employers built the first chemical wood pulp mill in Canada at Windsor Mills, where production began in 1899. At the beginning of the present century the output of the pulp and paper industry in Canada was valued at about \$8,000,000, increasing to \$137,913,000 in 1919. In 1943 the value reached a new high peak of \$345,653,000.

—DOMINION BUREAU OF STATISTICS

WHEN IT WAS EVIDENT that shipping difficulties might impede the imports of chromite into Canada, steps were taken to encourage production from the known deposits in Quebec. Chromite is used in the manufacture of refractory brick, as ferrochrome in the manufacture of certain ferrous alloys, and in the metallic form in certain non-ferrous alloys. Production in Canada rose from 355 tons in 1940 to 2,720 tons in 1944.

—DOMINION BUREAU OF STATISTICS

# Five Years Too Soon?

*In the summer of 1940, Technocracy began urging North American to adopt Total Conscription as the most efficient method of defeating fascism abroad and at home. Today, Technocracy reiterates its demand for the technological consolidation of this Continental Area to win the battle of the peace.*

**I**N the early summer of 1940 the armed might of the Third Reich descended upon the low countries and France in the face of a merely token resistance and thereby completed the piecemeal consolidation of a fascist Continent into of Festung Europa. The strategy of internal corrosion by fascist intrigue had succeeded to the letter, even while North America, boisterously excited about it, knew not yet what it was. Technocracy Inc., knowing fascism by its right name, demanded immediately that the Governments of Canada and the United States carry out a program of Total Conscription of Men, Machines, Material, and Money for the defeat of fascism abroad and at home! Technocracy presented to North America the minimum specifications for defense of Continental North America against a worldwide fascist conspiracy which stood ready to attack North America from all sides simultaneously when the time was ripe. The

demand has been widely supported, but it was ignored. Technocracy repeated its earlier demand that North America cease and desist from the export of the sinev of war to the world's fascist states regardless of their nominal neutrality. The export continued.

Between North America and fortress Europe Britain stood alone.

In making this brief analysis of the course of the war Technocracy wishes it clearly understood that for the personnel of the allied armies, navies, air forces and merchant marine it has nothing but the highest respect. Within the limits of the grand strategies employed and equipment provided they have done a job that shall live in history. Technocracy honors with its salute those who fell in the struggle against fascist aggression. Technocracy acknowledges the tremendous and valuable job done by those who maintained the plants at home.



The lifeline of aid to Britain did not because America established command of the sea, but because this Continent's incredible technology succeeded throughout 1942 and into 1943 in building ships faster than undersea fleets of the Third Reich could sink them.

Britain retained control of the sea partly by good old Britishness, partly by the dauntless, fearless courage of the Spitfires, but largely as a result of integrity and persistence of scientific men of vision in the face of National apathy and inaction. One was the designer of the Spitfire Mk I, the other the inventor of the British radar equipment. Thousands died after, but these are the men whose contribution was decisive. The enemy who had bungled the Schlieffen Plan in 1914 obliged by permitting a historic repetition in failing to consolidate its gains in North Africa, the gateway to Europe's soft underbelly, and Europe's southern outer wall, was thus frittered away; England, the Okinawa of Europe's defense, was not overwhelmed, but as a result of hard fighting sheer bluff, and partly in the interests of historic boner number

three, the calamitous attack upon Russia.

The Japanese, evidently forgetting that a sunken fleet can be replaced, since such a feat is hardly possible in Asia, failed to consolidate its Pacific gains especially at Pearl Harbor.

Now it can be stated that at the time to defeat Germany was within a few months of the successful creation of an atomic bomb, possibly also an atomic engine of propulsion. She was likewise within a few weeks of successful completion of fighter aircraft of a new and unique design and, by all accounts, an unsurpassed performance. Scattered accounts of progress made in the direction of other and even more fantastic weapons cannot be off-handedly discredited, as they do not come from screwball sources.

The German blunders which saved the non-fascist world from inconceivable destruction at the hands of the fascist world seem to be these: the muddlement of superman philosophy into a half-baked science of geopolitics to the neglect of the essential physical facts of Europe's geographical conformation; the incoordination of the German general staff and the German state in the pur-

suit of a dream of 'destiny', and, last and most important, the interference with mobilization of scientific research which seems to have occurred as a further error on the part of the political state.

Can anyone say for sure by what narrow margin the allies escaped disaster? Four Scandinavians endured for several months the hell of Arctic winter night and succeeded in crippling a heavy water plant. The British Prime Minister announced that a bomber crew had succeeded in scotching another. The fate of the non-fascist world may conceivably have hung upon the lives of just such a handful of heroic men.

Certainly Technocracy can concur in saying that 'never was so much owed by so many to so few.' But let Technocracy add that 'never was so little owed by so many to their own unity of national valor and foresight.' For apart from those millions in the services above mentioned, our national unity was a united scramble for the wages, profits and differential advantages of war; our national foresight was the petty acumen of politics and business.

It may be argued that Tech-

nocracy's specifications for Continental defense were given to world before their time. North America was spared need for installing them by not being more tangible than damnable luck. Technocracy is not credited by having been in the five years too soon.

In September 1939 Technocracy Inc. laid down a new and revolutionary concept of a Pax Americana. The San Francisco conference achieved a weird effigy 'Pan Americana' by a set of lomatic manoeuvres which carried forward into a world era as a system of bloc creation, may well plunge America into a war with the Soviet Union as Technocracy has bluntly indicated before. The success of atomic bomb is now a sober fact and 'he who creates a new world does so in the certain knowledge that it will be stolen.' It is a further sober fact that radio control can now be accurate for distances up to 1400 miles with error of less than 0.5 per cent. This margin may even now be good for greater distances. What of the future? This Century now appears to possess a lion's share of the world's



, but if America should for reason permit herself to be involved in war with the Soviet Union, or with a possible pan-Asiatic bloc, or with a possible combination of nations, the bulk of our uranium reserves lie within an area which easily become a battlefield. Technocracy's delineated area for defense of America is of utter ultimate importance now as ever before.

South Africa's Jan Christian Smuts has taken it upon himself to warn America's youth to be ready for another conflict. Pistol-patting Patton has jovially gone on record with the same happy suggestion. Technocracy has no intention of standing idly by and permitting this country or this continent to be manoeuvred by the senile fears of the Russos. Yet Technocracy does more than support the exponents of national military training for youth: Technocracy has advocated and continues to advocate the establishment of a permanent reserve force of one million offi-

cers, fully competent engineer-mechanics kept up-to-date in the mastery of technological warfare, to act as instructors for all of America's able-bodied youth. Why piddle around with debatable half-measures?

Technocracy has demanded that the people of North America establish a full economic and military alliance with the U.S.S.R. Technocracy has demanded that America, in achieving its Continental technological destiny, establish Pax Americana for all time. Technocracy has shown that only contiguous, self-contained, and self-sustained Continental organisms of the order of North America, as this world's number one technological area, and of the Soviet Union as the world's number two technological area, can coexist in a state of permanent peace in the world of today and tomorrow. Therefore, let America lose no further time in consolidating the defense and technological operation of this Continent that it may remain America—now and forever. —**Ted Fearman**

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UNFORTUNATELY, we are much further from victory over fascism than from victory over the German armies. Fascism fights us in both continents in the New World. Fascism will fight on from new basis after military victory is complete.

—HENRY A. WALLACE

# Civilization Is Facing Disaster

*If our political and economic thinking were conducted on the same level of efficiency and modernity as our scientific work and engineering activities we could be enjoying a material utopia with a minimum expenditure of physical effort.*

—DR. HARRY ELMER BA

NEVER before in the history of mankind has there been such a gulf between technology and social institutions. We have a thoroughly up-to-date material culture, complete, varied and potentially efficient beyond comparison with that of any earlier age.

On the other hand, our institutions and social thinking, through which we seek to control and exploit our advanced material culture, is an antiquated mosaic compounded of accretions added from the stone age to the close of the eighteenth century.

When a man desires to have a bathroom faucet repaired, a new tube put into his radio or a tooth pulled he thinks he must call in an expert.

Yet when he faces the much more complicated problems of public life he rests completely satisfied with the opinions of the man in the street. He wants a brain trust to design his automobile, but won't have anything to

do with one when it comes to planning his government.

This is no idle gossip or armchair reading. It lies at the heart of our social crisis today. No matter what aspects of our social problems we consider, it is always a secondary manifestation of the major evil of our day—the gulf between machines and institutions.

If our political and economic thinking were conducted on the same level of efficiency and modernity as our scientific work and engineering activities we could be living in an era of international security and could be enjoying a material utopia with little expenditure of physical effort. We produce goods with the very latest machinery, but we utilize it by means of ideas and institutions which date back a century or a millennium.

However light-heartedly we may view this striking discrepancy in our civilization between our machines and our institutions,



rightful penalty has already been exacted for our dilatory policy, and if this condition continues it may demand the supreme penalty of the extinction of civilization.

His fatal maladjustment in temporary life has produced economic depressions and countless financial disasters. It has brought democracy close to extinction. It has made our legal system inadequate and produced widespread contempt for law in general. It has given us a crime running into the billions each year, and enabled the greater criminals to render themselves

safe from molestation, to say nothing of conviction. It has bred moral chaos and educational futility.

The upshot of all this is the spectacle that we behold today—the impending collapse of western civilization from internal weaknesses.

If society wakes up in time and closes the gulf by bringing our institutions up to date, we may literally 'inherit the earth.' If we go on as we have so far in the twentieth century there is not even a gambling chance of preserving civilization for more than another generation.

—Dr. Harry Elmer Barnes



NEW YORK, Aug. 27. — The atomic ovens that make the new plutonium metal bombs in Washington State are producing nearly as much energy as will the Grand Coulee Dam in the same state at its peak.

Grand Coulee will have a hydro electric capacity of 2,000,000 kilowatts. The atomic oven power is in the form of heat which, although a fraction of it is enough to warm the great Columbia River in a day, is not at present useful. The ovens are designed to get rid of heat, instead of collecting it for power.

Redesigning the ovens to produce steam is an engineering job that may take years. The atomic heat at present is spread like a prairie fire, over a large area. There is no engineering method of using the heat of a prairie fire.

However, in the present ovens the atomic fires are not as hot as those in a burning prairie. About 300 degrees Fahrenheit is the top temperature permitted for the uranium slugs that are baked to make plutonium.

This temperature is not the highest possible. But experiments have not been reported as to how hot an atomic fire can be run with safety. Atomic fires also may be set up in a more concentrated form. This too, is an engineering problem yet perfected.

—ASSOCIATED PRESS

# A Ten Year Battery

*Unless North Americans eliminate Price System methods of operation they will have won the war only to lose the peace. Total description by the Government of all patents, inventions, and processes is the answer to fascist cartelization in the immediate postwar period.*

FOR years Technocracy has been pointing out that the Price System sabotages technology. The anti-trust suit which was filed in the U.S. Federal Court against the Electric Storage Battery Company of Philadelphia, and its wholly owned subsidiary, the Willard Storage Battery Company of Cleveland, is merely another sample of a Price System at work.

The complaint, signed by Attorney General Francis Biddle, alleged that the above named companies—two of the largest manufacturers of storage batteries in the world—had withheld a long-life storage battery from the market in the United States, with the alleged result that operation of military equipment had been greatly affected. Mr. Biddle charged that the product known as the nickel-cadmium battery had a reported ten-year life span as against three years for average batteries. 'Cadmium batteries have not been made, used, or

sold in this country and have been used by the armed forces of the United States,' the suit stated. 'As a result of the conspiracy herein alleged, the United States has had neither the commercial experience nor the manufacturing facilities necessary to determine the advantage of cadmium batteries over other batteries for commercial and military uses.'

The companies were charged with maintaining international cartel agreements to divide world markets and to eliminate competition in the manufacture and sale of electric storage batteries in violation of the Sherman Anti-Trust Act.

Mr. Biddle also alleged that the defendants conspired with Canadian, English, and German companies in a series of agreements and acts going as far back as 1914 to eliminate competition among themselves in world markets by allocating to each exclusive sales territories and by fixing prices in non-exclusive territories.'



he complaint named as co-spirators but not as defendants in the suit, the Chloride Electrical Storage Company, Ltd., London, to be the world's leading manufacturer of electric storage batteries, which has 49.77% of its stock held by the Electric Storage Company; Accumulator-Fabrik Aktiengesellschaft, Berlin, the largest manufacturer of electric storage batteries in Germany when it was in operation, and the Exide Batteries of Canada, Ltd., Toronto, wholly owned subsidiary of the Electric Storage Battery Company and a leading manufacturer of batteries in Canada.

Mr. Biddle claimed that the conspiracy resulted in restriction of exports of storage batteries by Electric Storage Battery Company and its subsidiary in world

markets; restriction of production and distribution in the United States. He pointed out that the Electric Storage Battery Company has become the dominant storage battery producer in that country.

The complaint charged that the major agreements and understandings in this continuing conspiracy were based on patents that 'have all expired.'

With World War II coming to a close, North Americans must mobilize for the peace. Unless they eliminate Price System methods of operation they will have won the war only to lose the peace. Total Conscription by the Government of all patents, inventions, and processes is the answer to fascist cartelization in the immediate postwar period.

—Robert Lyall

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WHILE THE EFFICIENCY ENGINEERS save a few drops at the spigot, a rent is rushing out of the bung-hole. What is the use of making two blades of grass where one grew before when the whole may be burned or abandoned? An economy that relies for its stimulation on waste and disaster is taking the road to oblivion as surely as the dinosaurs, those creatures that were all bulk and no brains . . . I have in my files pictures of veritable mountains of oranges, potatoes, and other crops marked for destruction. Nearly every farm crop has been plagued by surpluses since the last war . . . In the case of factories the problem of surplus is present in the form of excess capacity, but the mountains of unsold manufactured goods cannot often be photographed. A factory can close down faster than a failing crop.

—STUART CHASE in *Where's the Money Coming From*

# 'So You Can't Have Health?'

*Author Dyson Carter shows how medical discoveries are interfered with or suppressed in order to maintain an abundance of disease, a scarcity of curative methods, and a high price for individuals and groups who make a living out of peoples' sicknesses.*

**I**N the opening paragraph of **So You Can't Have Health?** Dyson Carter says: 'This book reveals facts about your health which have been totally suppressed. Although you rightly feel that your state of well-being or sickness is a strictly private matter, your own personal concern, nevertheless very powerful individuals and groups make it their business to interfere with your health.'

Author Carter then proceeds to document his thesis with concrete examples which indicate that Price System methods keep us from enjoying a much higher standard of health than we know today.

In his first chapters Carter tells the story of Dr. Harry Steenbock, 'The Wisconsin Alumni Research Foundation,' and Vitamin D. Carter's account—which is backed up by U.S. Department of Justice documents and court records (notably those covering the Rene

Douglas case, and in 'Vitamin Technologists vs. the Foundation,' U.S. Circuit Court of Appeals for the Ninth Circuit, No. 10079, November 24, 1944)—states that Steenbock and his associates scored the following Price System successes:

1. They had an American monopoly of Vitamin D production and sale, preventing all other groups from using Steenbock's discovery, dictating prices, and rigidly limiting the amount of the Sunshine Vitamin which could be sold.

2. They gathered together a group of powerful pharmaceutical (drug) manufacturers who agreed to co-operate to prevent any new Vitamin D process from being used.

3. They were able to force the public, the drug trade, and the medical profession to pay unbelievable prices for this health-giving substance: one million units of Vitamin D costing 15 cents to make was sold to drug wholesalers at \$3 to \$7, to the public and doctors for \$5 to \$11. (

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*SO YOU CAN'T HAVE HEALTH? is published by the Progress Publishing Company. Price: 25 cents.*



oil prices in Canada range from 1.25 for a prescription specialty up to \$19.45 per million units, the price of a standard Vitamin D preparation for babies being \$7.00 per million units—for fifteen cents worth!)

4. They were able to prevent the use of Vitamin D in everyday foods; when they did allow it to be used in such foods, for advertising purposes, the manufacturer was not permitted to put enough Vitamin D to cure rickets.

5. They carried on a clever publicity campaign which gave the impression that the Foundation was doing everything possible to promote Steenbock's discovery and rid the world of rickets-crippled children and mothers.

6. They effectively prevented any lowering of Vitamin D prices by using a 'black list' of drug companies that wanted to sell the vitamin at a reasonable price.

7. They suppressed scientific research which would have shown how Vitamin D could be made by other and even cheaper processes than Steenbock's; they sought up cheaper processes and suppressed them. Years ago the Milas Process for making Vitamin D at low cost was purchased by

Dupont, one of the Foundation's licensees; this was done 'to prevent anyone from using it to manufacture Vitamin D in competition with the Steenbock patents.' To this day the Milas Process has not been used by Dupont. It is a suppressed discovery.

8. They extended this North American cartel to a gigantic world cartel to exploit Vitamin D, dividing the earth up among themselves, the notorious I. G. Farben cartel of Germany, and other trusts.

9. Because ultra-violet light was required in the Steenbock processes, the Foundation further tightened its monopoly by signing up two of the biggest U-V lamp manufacturers; the latter agreed to sell their lamps only to companies approved by the Foundation.

To show how monopoly controls the use of other vitamins, Carter compares their cost and selling price: One gram of Vitamin C can now be produced for 3 cents; it sells in the drug store for as high as 60 cents. One gram of Vitamin B1 costs 20 cents to make; it is sold for as much as \$6.

In a chapter on 'Baby Bargains —\$25 Each' Author Carter recalls the nutritive experiment with

several hundred Toronto mothers in which it was proven that the majority\* of Canadian babies (about 51%) who die in child-birth or soon after might be saved by \$25 worth of food, which contained Vitamins B, C, D, and the amino acids.

Throughout, Carter shows how medical discoveries are interfered with or suppressed in order to maintain an abundance of disease, a scarcity of curative methods, and a high price for individuals or groups who make a living out of peoples' sicknesses.

This is a book that should be

read by every North American Technocrats, with their previous background of information on the monetary motives of Price System operation, will find it particularly significant. They will welcome the documentation on cartel interference with public health. At the same time, they will see that it is the Price System game itself—and not individual human perverseness—that leads to such socially detrimental behavior. They will, therefore, be more objective and less emotional than Carter in utilizing the facts that he has accumulated.

—Donald Bruce

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★ IN 1884 the steam boat, the steam engine, the cotton gin, the electro-magnet telegraph, sewing machine, and bicycle had been invented. Chloroform and ether were known and yet the then U. S. Commissioner of Patents made this statement: 'We see the arrival of the period where human improvement is at an end.' During the next few years, the Bessemer steel process was invented, aniline dyes and cocaine were isolated, and somewhat to my regret, the lawn mower and the typewriter were invented. This so impressed the then U. S. Secretary of the Interior that he announced in 1875: 'New materials and new inventions have now transformed our society into its final phase, so scientific inventions can take us only a little way further.'

These people and their more modern counterparts are probably all direct mental descendents of a legendary bird known as the little auk, who always flew backwards to keep the wind out of its eyes, and also because it was more interested in seeing where it came from than where it was going.

—R. C. SWAIN, RESEARCH DIRECTOR, AMERICAN CYANAMID CO.

★ THE FIRST WORLD WAR required a total of only 62,000 tons of rubber. In this war we have already consumed fourteen times that value for direct military use. We have supplied 167 pounds of rubber products, practically his weight in rubber, for every man in the armed services. Every bomber uses almost half a ton of rubber in bullet sealing fuel cells and the B-29's or Superforts use four times that much.

—DR. A. W. BULL, UNITED STATES RUBBER CO.



# Notes on Organization

TECHNOCRACY is an organization which has undertaken the task of preparing the people of North America for a major social change; a social change which the pressure of events, induced by the unique conditions prevailing on this Continent, will render inevitable; a change which will entail the abandonment of many of our cherished opinions and traditions; a change which will wipe out many of the values of yesterday and today; a change utterly beyond the vision of even the most radical political party.

We are living today in two worlds: First, there is the world of philosophic imponderables; the world in which we hope and vote for things to happen; the world in which the sanction of tradition and opinion governs our behavior. Then there is the actual physical world; the world we can perceive with our senses; the world in which events take place in accordance with physical laws. This latter world can be described by exact measurements and in clear terms.

A great deal of nonsense has

been disseminated by the 'molders of public opinion' regarding the Organization of Technocracy and its objective. Technocracy has been charged with 'soullessness and the deliberate cultivation of the materialistic concept of life.' Its objective has been described as the 'institution on this Continent of a scientific dictatorship, which will impose upon us a monotonous and mechanical regimentation.'

The physical world and our existence in it is the immediate concern of Technocracy, but this does not mean that Technocracy is dedicated to the materialistic aspect of life. Technocrats know that dreams and aspirations regarding the cultural aspect of life cannot be realized until we have established a firm foundation of social security for all the citizens of this Continent. We must build upon the concrete particulars of physical science and not upon the frothy generalities of political philosophy. The social aspirations of the Technocrats are based on factual knowledge and a comprehension of the most probable; they are not induced by wishful

thinking and ponderous platitudes.

Technocracy has no interest in perpetuating the business concept of existence. It does not compromise with any political party, radical or conservative. It is not attracted by the ideal of a well-organized poorhouse in this land of potential abundance. It does not subscribe to the doctrine of salvation through toil or believe that real prosperity will bring degeneration of our moral fibre. It is not to be diverted from its objective by the milk and water panaceas of the radicals or by the nebulous emanations of the intellectual liberals—those unfortunate people whose mental processes flap around in every emotional breeze, like Monday morning's washing on the line.

It requires a certain amount of mental discipline to analyze and, if necessary, to discard some cherished conception that is deeply rooted in the structure of the mind. We like to believe what we have always believed, and whenever doubt is cast upon our beloved assumptions, we immediately look for arguments to justify them. Most of our so-called thinking consists of finding excuses for continuing to believe what we

have been conditioned to believe

We are creatures of habit and we want to cling to our established lines of thought, action, and behavior as long as possible, and it is rather astonishing how much hardship and discomfort we are willing to endure in order to cling to them. However, the people of North America will shortly be confronted by the greatest problem of readjustment that has ever faced mankind: The stress of circumstance, induced by the application of physical science to the means whereby we live, will force us to adopt other lines of thought, action, and behavior, which without competent leadership will stall us on the way to the highest type of civilization this planet has ever known.

Technocracy does not expect that all the citizens of this Continent can discard their mental shackles in time to be of much use in the critical days that lie ahead. However, if the intelligent minority can clean their minds of the accumulated trash of centuries, they can provide the leadership along the road which will culminate in a new way of life and a culture beyond our present imagination.

—J. H. Soar



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. *Encyclopedia Americana* says: 'Whatever the future of Technocracy, we must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Bunde (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves into an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Let's Declare War on Peace!

*NORTH AMERICA'S WAR is here and now, in this country and on this Continent—a patriotic war against the peace of this Price System, against its poverty and its malnutrition, its crime, its sudden death, and its disease. It is a war of plenty versus poverty, of technology versus toil, the war of tomorrow against yesterday, of science versus chaos.*

*War ends in victory or defeat, but the peace of this Price System has no end, merely disintegration. So let's offer the youth of this Continent a new war, a fight worthwhile, a battle royal, a war to fulfill this Continent's rendezvous with destiny. Let's declare war on peace, the peace of this Price System.*

—HOWARD SCOTT

(SECTION STAMP)



# **TECHNOCRACY DIGEST**

**'Export or Die'**

**Planes Into Houses**

**Technology Smashes the Price System!**

**Steel Capacity Has Doubled**

**The Atomic Revolution**

**The One-Hour Work Day!**

**'The Road to Serfdom'**

**Ct.**

**PUBLISHED IN CANADA BY SEC. 1 - R. D. 12349**

**TECHNOCRACY INC.**

**25c**

# TECHNOCRACY DIGEST

THE ONLY MAGAZINE IN CANADA THAT IS PREPARING THE PEOPLE OF THIS  
COUNTRY FOR SOCIAL CHANGE

OCTOBER, 1945

VANCOUVER, B. C.

No. 88

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# 'Export or Die'

*Confronted with ever-shrinking export markets due to the competition of cheap mass-produced goods and the increasing self-sufficiency of other areas, any nation that must 'export or die' will surely die.*

WITH the cessation of American Lend-Lease to Britain, the attention of press and public has been focussed upon the precarious economic position of the United Kingdom. Britain, faced with an annual gap of \$5,400,000,000 between foreign commitments and export revenues, is trying to rally her economic forces with the slogan: 'Export or die.'

Prime Minister Attlee told the House of Commons recently that Britain's overseas outlays on the eve of Japanese defeat were equivalent to a yearly expenditure of \$9,000,000,000. Against this, exports and other sources of foreign income totalled \$3,500,000,000.

The following items selected from **Fifty Facts About Britain's War Effort** (published by the United Kingdom Information Office in November 1944) reveal how World War II critically damaged an already lopsided economy (in 1938, Britain's total im-

ports were \$4,140,000,000 and exports \$2,385,000,000):

'In five war years, total Government expenditure in Britain has been about \$93,000,000,000. Expenditure in 1943 was nearly six times the expenditure in 1938.'

'In meeting the cost of the war in 1943—\$23,000,000,000—Britain raised half the sum needed by taxation and other revenue; almost one-third—\$7,000,000,000—by private savings; and almost all the remainder—\$3,238,000,000—by the sale of assets abroad and disinvestment at home.'

'The number of income tax payers in Britain rose from 4,000,000 in 1938-9 to 13,000,000 in 1943-4. Income tax is at a standard rate of 50%.'

'In Income Tax alone, a married man with two children in Britain pays \$304 out of an income of \$2,000 a year, or \$1,204 out of \$4,000 a year. In the higher brackets, Income Tax and Sur-tax takes \$5,528 out of an income of \$12,000, or \$27,128 out of an

income of \$40,000. In the case of incomes over \$80,000, Income Tax and Surtax rise to 97.5% on the part in excess of \$80,000.'

'In addition to Income Tax all businesses in Britain pay an Excess Profits Tax of 100%. Indirect taxes in Britain have more than doubled.'

'On a pint of beer, the duty is 12.5 cents. A pack of 20 cigarettes costs 47 cents, of which 35 cents is tax. Purchase tax on a wide range of goods varies from 16% to 100%.'

'In mobilizing her resources for the war, Britain rigorously cut capital maintenance and new equipment at home. "Disinvestment" at home in 1942 and 1943 alone amounted to \$1,260,000,000. In addition, there is the cost to be faced of the widespread devastation of buildings, industrial plants, public utilities and private possessions throughout the whole of Britain.'

'To pay for essential imports and meet military expenses in other countries, Britain, up to June 1944, sold overseas assets to the value of \$4,260,000,000, and increased her overseas liabilities by \$9,200,000,000.'

'British exports in 1943 were less than half the pre-war amount

by value, and less than one-third by quantity.'

'By mid-1944 only 4% of all persons in British manufacturing industries (including mining) were engaged in production for export, as compared with 15% before the war. Exports of spirits were 60% of the 1938 figure; woollen and worsted goods, 50%. Pottery exports were cut to 43%; cotton piece goods to 27%. Iron and steel exports have virtually vanished.'

'Britain's program of Mutual Aid for her Allies cost, up to June 1944, more than \$4,000,000,000. Of this total, Reverse Lend-Lease to the United States cost Britain almost \$2,500,000,000, an aid to Russia more than \$1,000,000,000.'

These are the reasons why the ending of American Lend-Lease was such a deadly blow to Britain's economy. Its paralyzing effect can be even more clearly understood when it is realized that recently U. S. shipments have comprised one-quarter of Britain's meat imports, nearly one-half her imports of butter and eggs, and more than three-quarters of her imports of tobacco. During 1944, Lend-Lease food items alone represented 10%



Britain's total requirements.

As Britons survey their war-wrecked financial structure in gloomy wonderment about the future, they are finding 'victory a word with a hollow ring.'

According to press reports, peace has meant less food, less beer, fewer clothes, fewer cigarettes. Since V-J Day many rationed foodstuffs have been cut: cooking fat from two ounces to one ounce a week; bacon from four ounces to three ounces; soap from four ounces to 3½ ounces a month. The milk ration is less than half a pint a day. The margarine ration was reduced from two pounds to one pound a month and clothing was cut so that one coupon is worth just over half its value in 1941.

Queues are as long as ever, if not longer. Hopes of a reduction in income tax have faded. Luxuries and semi-luxuries such as radios and cars are scarce and expensive. To get new furniture, blankets, and linens a man has to hurry or have lost his home in the bombing. Many couples must spend the first few months sleeping on the floor.

Technocracy has long known that Britain would eventually arrive at her present precarious

position. In a survey of the natural resource potential, technological status, and social trend of various national entities, Howard Scott told the world in 1932:

'The United Kingdom, with an area of 121,000 square miles and a population of 49,000,000—or a density of 400 inhabitants per square mile—with arable land amounting to only 23% of the total national area, finds itself in the physical position of possessing only a single energy resource, and that a declining one. Its tin gone, as well as its copper and lead, its iron requiring 56% foreign beneficiation in order to produce steel, its coal becoming more and more difficult to mine, the United Kingdom is fast retrogressing from its position as the possessor of easily available energy to its next most probable energy state as two islands off the coast of the European continent. A valiant race, fighting a losing battle, is displaying an admirable fortitude in the crisis that is resulting from excess population, declining resources, and obsolescent equipment operated by the antiquated methods of a Price System.

'The United Kingdom will be forced by internal pressure to

adopt measures even more extreme than the flight from the gold pound. It may be compelled by the growing disparity between its own industrial operation and the world trade balance to such extremities as abandonment of monetary currency and the accompanying credit structure. In that event, a British currency of pure fiat power might be attempted as a last desperate resort. The present deflationary program may be reversed in the near future to one of inflation, a last straw grasped at in England's struggle for the export markets of the world. Sooner or later, in spite of British imperialism, the United Kingdom, under a Price System, will be forced to meet a situation that will be increasingly grave in its internal operation . . .'

Today, in 1945, the United Kingdom is confronted with the situation predicted by Technocracy in 1932. In a desperate effort to keep their economy afloat, the people of Britain have elected a Labor Government, retained wartime controls, and started to nationalize key industries. They are feverishly producing commodities for export in preference to badly-needed goods for home consumption. Already merchant ves-

sels are steaming from British ports with the first postwar export models of United Kingdom automobiles—and manufacturers have said that one out of every two cars coming off the assembly lines are earmarked for the overseas markets.

As this is being written, Lord Keynes, advisor to the British treasury, is negotiating with Canadian trade officials. It is reported that the discussions may achieve a compromise which will provide Britain with credits to continue her heavy purchases from Canada.

The present session of Canadian Parliament is expected to deal with the matter of extending aid to Britain, either by a loan or even an outright gift, possibly in the vicinity of \$1,000,000,000.

Technocracy points out that any such measure is merely a temporary soporific. Britain is facing a basic crisis in her international operations which was clearly apparent long before the war. Any aid that Canada or the United States can give will be in the nature of international subsidy relief.

Britain has had her day. She was the first country to take advantage of the Industrial Rev-



lution. The greatest manufacturing nation of the world for many decades, she imported raw materials and sent them back to their sources as finished products.

With the increasing use of technology among her competitors and the decline of her own resources, the trade winds started to blow in the opposite direction. Instead of a favorable trade balance, Britain began to face a deficit.

Other areas with greater resources had commenced to fabricate goods, too. Almost every region of the globe became more self-sufficient. Today, the United States, Russia, and Canada can produce within their own borders practically all the food and other materials that they need. Britain grows only half her food and her factory wheels will not turn unless she imports cotton, wool, lumber, iron ore, rubber.'

Her technology is far behind that of the United States. A recent survey showed that even in textiles, Britain cannot compete with America. A great deal of her textile equipment has been obsolete for 25 years, and production per man-hour is consequently much below the U.S. output.

There is only one solution to Britain's problem—and that is the one indicated by Continental Headquarters of Technocracy Inc. in a release entitled, 'There'll Always Be an England' (see **Technocracy Digest**, June 1945):

'The British Isles, if socially reorganized under a technological control, can provide a high standard of living for 15 to 20 million total population over an extended period. If the British Isles maintain their present population, they will face a future of decreasing standards of living, rising population pressure, and greater poverty which can be solved only by the export of Britain's surplus population overseas. It is with this in mind that Technocracy advocates that the Dominion of Canada grant immigration preference to 35 million British subjects.'

Caught in a grinding physical progression, Britain's century-old structure has been doomed by factors beyond her control.

Confronted with ever-shrinking export markets due to the competition of cheap mass-produced goods and the increasing self-sufficiency of other areas, any nation that must 'export or die' will surely die. —Donald Bruce

# Planes Into Houses

*The conversion of a plane plant into a prefabricated housing factory while it creates jobs that didn't exist before the war, will displace many more men of the building trades than it will employ. Technology marches on!*

**W**ITH an unmistakable note of 'I-told-you-so' triumph, **Time** (August 13, 1945) reports that the Fairchild Aircraft plant at Longueuil, Que. has converted to the production of prefabricated bungalows 'made partly from surplus aluminum and with the very machines (some of them unchanged) that had been producing planes.'

The small bungalow is 27 feet by 28 feet, with living room, kitchen-dinette, two bedrooms, bathroom and foyer. The unit is shipped as a single package 30 x 10 x 10 feet, and it can be unpacked and set up by six men in a day, if the lot and foundation are made ready.

The plant had employed 9,000 men throughout the five years of its operation as an aircraft factory, but when the output dropped to only a trickle of plane parts 'to Canadians, long fearful of what postwar cutbacks would mean job-wise, it was an ominous portent.' But now, **Time**

takes pleasure in announcing that 'possibly as many as 2,000 men will have jobs that did not exist before the war.' Very nice, but to 7,000 former employees of the plant the end of the war is still just an ominous portent.

But the main blow to any postwar optimism which may be engendered by this converted plant is simply not referred to. Canada's housing situation is at this time acute and these dwellings will find a ready market as soon as they are offered for sale. Then woe unto the returning men of the building trades. For an all-metal structure, unless it is deliberately maldesigned, will be extremely durable. And for every prefabricated home that is set up during this time of housing shortage the postwar backlog of bungalow customers is reduced by one. The man-hours involved in the construction and erection of a prefab will be small compared with the man-hours of building trades time which this operation



orever displaces.

The stimulus of the world's first total war has created in Canada a production capacity without precedent. The restricted purchasing power of prewar years throttled technological progress, but during the war this has gone long unchecked. Now, for the eating of swords into ploughshares, Canada has a man-eliminating technology ready made, with (among its other resources) the world's largest hydro-electric power development per capita to

drive it. In the reconversion the plant changes will be only minor ones, and the tool-maker will accomplish most of them.

For ten years Canadians and Americans have been asked to believe that technological advances create employment because they open up new opportunities. In a very short time this delusion, which happens to be a deliberately fostered lie, will be rudely shattered as Johnny comes marching home.

—Ted Fearman

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TUNGSTEN IS ONE of the most important of the war metals. For many years the chief source of supply was China and Burma, but shortly after war broke out, and later when Burma was taken by the Japanese, the tungsten situation in Canada became serious. Tungsten ore was known to occur in some gold mines, and steps were taken to recover wherever possible the tungsten from this source. Hand sorted ore was shipped to the Bureau of Mines, Ottawa, for treatment. In addition, a treatment plant was built at the Hollinger mine, to which other mines could ship their ore. Sheelite ores were also treated at Val d'Or, Quebec, and at Little Long Lac Mine in Ontario. Intensive efforts were made to recover tungsten ore in all parts of Canada, and the ultra-violet lamp was brought into use by mine managers and prospectors. Production of tungsten concentrates in 1944 amounted to 1,000 pounds as compared with 521,000 in 1942 and 12,000 in 1940.

—DOMINION BUREAU OF STATISTICS

A GENERATION AGO the kerosene oil lamp was the principal means of illuminating our homes, as it is in many homes even yet. It superseded the candle for general use, until kerosene itself was displaced by gas, to be followed by electric light. It is perhaps not generally known that a Canadian geologist invented and developed the process for making kerosene, or coal oil as most of us call it now. The discoverer was Abraham Gesner who was born at Cornwallis, Nova Scotia, in 1797. He made his discovery in 1852 at the age of 55. The 1941 census of Canada showed that 69.1 percent of all occupied dwellings in the Dominion were lighted by electricity, 30.5 percent by kerosene or gasoline, and 0.4 percent by gas. The proportion of homes without electric light was considerably higher in farm communities than in urban areas.

—DOMINION BUREAU OF STATISTICS

# The One-Hour Work Day!

*With the increasing use of technology, man is headed toward greater leisure. Going far beyond Technocracy's conservative estimate of four-hour work day, some persons are visualizing a one-hour day or even a one-hour week.*

**I**N 1916 Lord Leverhulme estimated that one hour's work per week per person, adequately directed, might supply all our needs for food, shelter and clothing. That was twenty-nine years ago when our productive capacity was only half what it is today.

Why has the increase of mechanical productivity not been accompanied by a corresponding reduction of the working day?

The answer runs something like this: Production has become scientific, but the distribution and consumption of the goods produced demand an equally scientific method which is so far lacking. As things are, distribution and consumption are haphazard and chaotic. Energy is misdirected. Wastage of materials and effort is enormous, which proves that we solve our mechanical problems far in advance of our politico-economic ones.

Moreover, there are many new

techniques which are held in check because their appearance would replace existing plant and might threaten the financial stability of certain businesses. Invention means change. Change frequently means industrial upheaval and loss of profit for individual concerns. An instance of this is Faraday's discovery of electro-magnetic induction in 1831. That discovery lay neglected for over fifty years and was not applied to industry until Edison built the first power-plant in 1882.

We have an illuminating glimpse of the possibilities of the future in a page from a recent book by the Very Rev. Hewlett Johnson, the Dean of Canterbury, who writes: ' . . . new industrial triumphs await the practical use of materials now available; materials of unknown lightness, strength and flexibility: light metals to replace iron; steel-reinforced metal films thin as bubble and of inestimable value in chem-

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*Condensed from TID-BITS, London, England.*



cal and electrical plants; glass, workable as metal, and colloid-expanded glasses, heat-proof, sound-proof, transparent and light as cork.

'Chemists only await the order to make our clothes from cellulose materials such as wood; light and porous clothes, and pressed into shape without the cycle of processes from spinning to tailoring; clothes produced at the cost of pence, not pounds. Plastic materials of infinite variety can follow—as soon as we will—the bakelite with which we are already familiar.'

You have probably heard of the televox. It is an ordinary telephone apparatus containing a robot mechanism that obeys spoken instructions. You install it, let it say, in a power station and leave it unattended. During the night, you ring up the station and convey your message by uttering sounds of different pitches. The robot telephone-operator-cum-technician does the rest.

Then there is the Product Integrator, a superhuman calculating machine that can work second order differential equations beyond the power of the human brain. By electrical and mechanical means, it can, in the space

of minutes, solve mathematical problems that would occupy the human intelligence for a considerable time.

And think of the miraculous automatic devices used in modern industry—selective mechanisms that separate one type of article from another by its sound or touch; in other words, super-sensitive artificial ears and hands; mechanical eyes, operated by means of the photo-electric cell, and those instruments which test chemicals by what might almost be called a 'sense of taste.'

If we dismiss as too fantastic Lord Leverhulme's estimate of having to work only one hour a week let us compromise and imagine ourselves working say, one hour a **day**. What kind of society do we visualize? In such a society, professional people—artists, musicians, writers, scientists and the like, whose output is often governed by mood and temperament—might be expected to carry on much as they are today. But the vast bulk of the population consists of those who produce the vital commodities—food, clothing, shelter, and so on, and who man our utility and transport services. John Citizen would go to work for the one hour of his appointed

shift relieving his predecessor and being relieved in turn by the next man.

The work of minding a machine might be tedious and dull but it would give John Citizen twenty-three hours in which to eat, sleep, attend to his home affairs, play games, read, worship, listen to music, go to the theatre and generally occupy himself as his inclinations direct. Or, if he does not mind a machine, he drives a bus or a train—for five hours, let us say, once every five days.

This picture presents its own problem—the use of leisure. To be able to use leisure intelligently and profitably is an art in itself, and one that must be cultivated diligently by our educational authorities.

Intellectual curiosity is the dominant characteristic of the educated mind. The man who possesses it looks about him and says: 'The world is mine to explore—the spiritual as well as the physical world, but what leisure have I for the task? I have an hour or two in the evening, but I am tired out after a day's work.

'I want to study the wonders of science, visit museums and laboratories, read books on biology

and discover how my body works. I want to study politics and learn how to increase man's happiness. I want to read all the works of the great classical authors and see the famous paintings.

'I want to go to concerts and hear the music of Beethoven and Mozart and Bach—and I want to make some of this music for myself by studying the piano, or the violin, or training my voice. I want to paint. I want to travel—by land, sea and air—and see how people live in other countries; I want to learn their languages. I want to study the philosophies and learn how our ancestors used to think; I want to contemplate the mysteries of nature and the universe itself.

There you have a picture—and it's a fairly common picture, fancy—of frustrated mental ambition, frustrated by insufficient leisure. But there is more to it than this, for I have selected only the intellectual type. We are not all dreamers. What about the practical man with his hobbies? It may be his garden, his carpenter's bench, bricklaying, a microscope, his rug-making. In the future he would have two or three hobbies where his sort of restricted leisure now permits



him only time—and barely that—for one.

Increased leisure for the pursuit of hobbies would go far to removing one of the most dismal characteristics of modern society, which is that man now languishes in a limbo of frustration produced by the paralysis of the creative spirit in a machine-ridden world.

Machines work for man; man has little leisure. The hand is starved; craftsmanship has almost vanished. So long as machines produce serviceable but inartistic

substitutes, all the beautiful objects which our ancestors carved in wood or fashioned from ivory will not be made—until, that is, man regains his leisure by the scientific application of his mechanical resources.

Man must ask himself this question. Will he develop these possibilities with all the imagination and skill which the situation demands? Or will he be content to watch scientific progress arrested by political ineptitude?

—Sam Heppner

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★ DOUGLAS FIR is the largest tree in Canada. It usually attains a height of from 150 to 200 feet, and a diameter of three to six feet, but it is sometimes found reaching heights of over 300 feet and diameters up to 15 feet. The trunk is straight and free or limbs for 70 feet or more. It has the heaviest bark of any tree in Canada, sometimes 10 to 12 inches thick. In Canada this tree ranges from the east slope of the Rocky Mountains in Alberta through to the coast in British Columbia, but the best commercial stands are on Vancouver Island and the adjacent mainland. As a source of the largest-sized structural timbers in commercial quantities, this species is unsurpassed. Douglas fir is obtainable clear from defect in large dimensions and has a wide range of uses—particularly as a structural timber. Flooring for dwelling houses and for heavy dock construction, general building purposes, water-pipes, silos, veneers and plywoods are some of its various channels of utilization. Production of Douglas fir lumber in Canada in 1943 amounted to 1,233,953,000 feet board measure valued at \$38,113,000.

—DOMINION BUREAU OF STATISTICS

★ CHARCOAL BURNING is an ancient art, the technique of which has been handed down from father to son. Different woods yield different qualities of charcoal, the variety employed for the manufacture of gunpowder, for example, being made from willow, alder and dogwood. Charcoal used by artists consists usually of a charred vine twig. Many Quebec farmers make charcoal in their spare time. They use sound hardwood, which they char in circular kilns of brick and lime reinforced with iron hoops. The production of charcoal in Canada in 1943 amounted to 83,742,000 pounds, including 59,030,000 made in the wood distillation industry and 24,712,000 in the charcoal burning industry.

—DOMINION BUREAU OF STATISTICS

# Technology Smashes the Price System!

*The industrial age, guided by men who had no conception of the powers that were at work, has at last turned upon its masters to destroy them and in that moment of destruction offers to the inhabitants of the American Continent a security that they have never known.*

—HOWARD SCOTT

A CRISIS in the history of American civilization is at hand. The nation stands at the threshold of what is simultaneously opportunity and disaster. The opportunity is one for social benefit, the disaster is the failure of the Price System; and neither opportunity nor disaster may be escaped. The mills of the gods have ground almost their allotted time and they have ground exceedingly fine. The spectacle of a New Jersey rayon factory now being designed to run eventually without human labor, save for one man at a switchboard, is more than a warning

of further unemployment, more than notice to competitors that a rival has lowered his production cost to a minimum. It is all of these things, but they are of superficial account. It is a witness to profound truth that only a few years ago was guessed at—that physical wealth is not measured in terms of labor, goods, or money, but in terms of energy. And with the discovery of that truth the bankers, the industrialists, the Marxists, the Fascists, the economists, the soldiers, and the politicians are things of the past.

The industrial age, guided by men who had no conception of the powers that were at work, has at last turned upon its masters to destroy them and in that moment of destruction offers to the inhabitants of the American Continent a security that they have never known. This crisis is not the result of political agitation. The agitators are powerless

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*This article, prepared under the supervision of Howard Scott and published by HARPER'S MAGAZINE in January 1933, is one of Technocracy's basic statements. The use of atomic energy and the present Price System crisis (which followed the withdrawal of World War II's artificial stimulation) have sharpened its significance. The editors of TECHNOCRACY DIGEST reprint this material now with the knowledge that the social analysis presented therein has stood the test of time better than that of any other organization in North America.*



While the very stars in their courses have been fighting for another order. We unwittingly have stolen a march upon history, and whether for good or ill a new chapter is about to begin. A few weeks ago the Governor of the Bank of England admitted that the difficulties are so vast and so unlimited that I approach the subject not only in ignorance but in humility. It is too much for me.' While the representatives of American industry and capital have been unwilling so far to commit themselves publicly, many are conceding in private that the problem is beyond them. One thing becomes very cold and clear: If we are to deal effectually with the depression we have got to understand the forces that brought it about.

The reason why America finds herself in her present agony is because for many years she has been ignoring physical laws which are fundamental to her operation. Her present troubles are only another warning that the final day of reckoning is at hand. To say in one way, the cause of our troubles lies in the fact that during these years, instead of thinking of our well-being and of the operation of our country, in terms

of energy, we have thought of it in terms of something purchasable with dollars. If we are to understand the problem at all we have to grapple with this question of energy; upon it everything else rests.

Prior to that glorious fourth in the year 1776 when we announced our independence to the world, there was no engine for work save man and his domesticated draught animals. There had been discoveries of various sorts before; but dismissing the experiments and devices of ancient times and the Middle Ages, leaving aside the water wheels and windmills which were crude, inefficient, and over-costly concerns, man and his animals were the only machines to do the work. Man was the engine, and with the energy furnished him by his body from the food that he ate he worked. It was man who built the aqueducts of the Emperor Augustus, man who constructed the great dome of the cathedral of the Incarnate Word of Byzantium, man who raised the spires of Chartres. The whole amount of energy was the food eaten by man and his domesticated animals and the fuel that he burned.

Energy is defined as the capa-

city for doing work. - All forms of heat transfer or of work done are said to involve transfer of energy. Thus a waterfall is continuously expending energy regardless of whether this energy is utilized or not. If a pound of coal is burned, the energy in that coal may or may not be used to drive an engine or to do other work; but whether or not work is done, after the coal is burned the energy it contained has been irretrievably spent. An automobile moves and does work because it is able to utilize the heat energy contained in gasoline. A water wheel turns by utilizing the energy contained in the water in motion at a waterfall. Everything that moves, including the human body, which runs by means of the energy contained in the food it burns, does so by an expenditure of energy. Through the expenditure of energy we convert all raw materials into the products that we consume and through it operate all the equipment that we use.

Do you doubt that this is true? Consider the shoes that you put on in the morning. They are made from leather, the hide of the cow that ate grass to provide the heat to warm her body and the

energy to chew yet more grass. The grass itself received, by way of the chlorophyll in its blades, energy from the sun. Removed from the cow's back, the hide was tanned, put in a car built of steel melted by heat energy, and transported over a railroad using steam or electric energy. It arrived, driven by electric or steam energy, was made into shoes. When you eat your breakfast, consider the source of your bacon and eggs, consider your newspaper how it was made and what it was made of, consider the street car or the automobile in which you go to work, how they are made, what they were made, and how they do their work. Everywhere energy, the source of life, is applied to matter, and behold the wonder is apparent.

We have said that before the day of James Watt and his steam engine man and his draught animals were practically the only engine upon this planet for doing man's work, in other words to consume and expend energy. Every social system which man set up from the day that Joseph interpreted unto the birth of Benjamin Franklin was rigidly limited by this fact. Cleopatra descending the Cydn



on her barge and Shakespeare, the dramatist, who described the event centuries later, were of the same age in this: In her day and in his, man and his animals could work so much in one day and no more. Not until the day of the machines arrived, machines which could multiply the rate of using energy thousands of times over, did an absolutely new influence appear in human society. It is because we have not taken thought of this influence that we in America find ourselves where we are today.

Our whole existence is and always has been a struggle for energy. The savage generated some energy in his own body, got some from his animals and his campfire, but ever since that day man has been fighting his way back to the original sources of energy. He found in coal the energy laid down ages earlier in the carboniferous period, he found another source of energy in water-power, he found a sea of oil prepared by nature long before the day of his Neanderthal ancestors. Later he has been prying at one of the last and most mysterious sources—atomic energy; but to us it is great good fortune that secret has not yet been put into his

bungling hands. Yet so great a store of energy has he already made available that, given the raw material, there is practically no comfort or luxury of life he cannot make for himself. Food, it is true, is still produced in the way that nature originally devised, but indefatigable mankind has discovered scores of ways to assist the process.

How does energy work? One of the fundamental laws is that which says neither man nor machine can work out of nothing, that is, without being supplied with energy. Who has seen an automobile run without gasoline or a street car without electricity? You cannot dodge the fact by saying: Let us hitch a horse to the automobile and have the buggy once more, for the horse in this case is the engine, generating energy from the oats he eats. The spectacle of the body of one of the unemployed found on the docks, dead of starvation, is a terrible witness to the fact that this great law cannot be violated. The man was denied energy, and life was taken from him.

Now energy appears in many forms but it is possible to measure them in units of work—the erg and the joule, or in units of

heat—the calorie. It is the fact that all forms of energy, of whatever sort, may be measured in units of ergs, joules, or calories that is of the utmost importance. The solution of the social problem of our times depends upon the recognition of this fact. A dollar may be worth—in buying power—so much today and more or less tomorrow, but a unit of work or heat is the same in 1900, 1929, 1933, or the year 2000. In a Price System wealth is produced only by the creation of debt. A man is wealthy only when he is a creditor. If his wealth consists of bonds stocks, mortgages, notes, equities, and so forth, he is merely the owner of a collection of promises to pay. Even currency is in this category, for you will find on the face of a dollar bill the words 'payable to the bearer on demand'—with no questions asked as to how he happened to be the bearer.

The units in which these forms of debt appear—be they stocks, bonds, or currency—are units of value. Value cannot be measured; it has no metrical equivalent. A pound of coal is always a pound of coal, but the weight of a dollar's worth of coal is seldom twice the same.

The dollar which is used to value a commodity is a purely arbitrary unit and has no metrical equivalent in the physical operation of our Continent. You do not ask for a yard of oil or a gallon of linoleum or a bushel of electric current. We shall have to return to this business of measurement a little later on, but this discussion will be far more clearly understood if this constancy of the energy unit is remembered.

We say that life uses its material substances over and over again when the cow eats grass, man eats the flesh of the cow, and at last man is returned to the earth from which grass draws sustenance. With energy this never happens. Once it is spent it is gone forever and we must seek new supplies and new sources. We are not alarmed over the possibility of a shortage of wheat, for we may grow it over and over since the sun is there to supply the energy again. But when our stores of coal and oil are exhausted, there are two sources of energy gone which we shall never be able to recapture; and they are not likely to be replenished while man is on the earth.

If we have energy available we

*(Continued on Page Thirty-five)*



OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN



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## *Steel Capacity Has Doubled*

**D**URING the war Canada's capacity to produce iron and steel commodities of all kinds has vastly increased. Her steel capacity is nearly twice what it was; her output of automotive products (biggest single steel item made here) has been boosted to the equivalent of three times its pre-war level.

Canada, which a decade ago had no producing iron mines, now has three with probabilities of more being added. Combined output of the three producers—all located in Ontario—may soon be at the rate of close to \$7-\$10 million annually with good prospects for substantial expansion of even this impressive total.

Algoma Ore Properties, a subsidiary of Algoma Steel Corp., commenced production July 1939, and results in practice have bettered by far the original estimates. Rated capacity was 300,000 tons annually, but in actual operation close to 500,000 tons of sinter (iron ore concentrate) have been turned out in a single year. In the latest year recorded—ending April 30, 1944—473,744 tons were mined.

At the Steep Rock Iron Mines, production was curtailed in 1944 by a slide of gelatinous ooze into the location of 'B' ore body open pit operation, but regular shipments are now going forward. Drilling

and development have demonstrated that Steep Rock possesses one of the largest tonnage and best grade hematite iron ranges known on the North American Continent and officials plan to extend the production rate substantially over a period of years. It is considered possible that around 800,000 tons may be shipped this year. With a reduction in stripping operations and a greater concentration on actual production a regular output of 5,000 tons daily is expected. About 50 million tons of ore have been proven by work to date and the company undoubtedly has resources for many years ahead.

The marketing contract of the Josephine mine of Michipicoten Iron Mines with Algoma Ore Properties calls for delivery of a minimum of 75,000 gross tons of hematite lump ore and 190,000 gross tons of hematite concentrate per year. Production capacity of the Josephine mine will be over 375,000 gross tons of ore per year. Reserves at the Josephine totalled 3,840,000 tons of hematite at the end of 1944.

At the Ruth property, adjacent to the Josephine mine, Michipicoten Iron Mines has indicated by drilling no less than 28.6 million tons of siderite or concentrating ore running 31.26% iron. It is expected that placing of the Josephine in production should facilitate the working of the Ruth property.

In recent years Algoma Ore Properties has indicated approximately 100 million tons of magnetite ore in its Goulais iron range—huge reserves are now awaiting development.

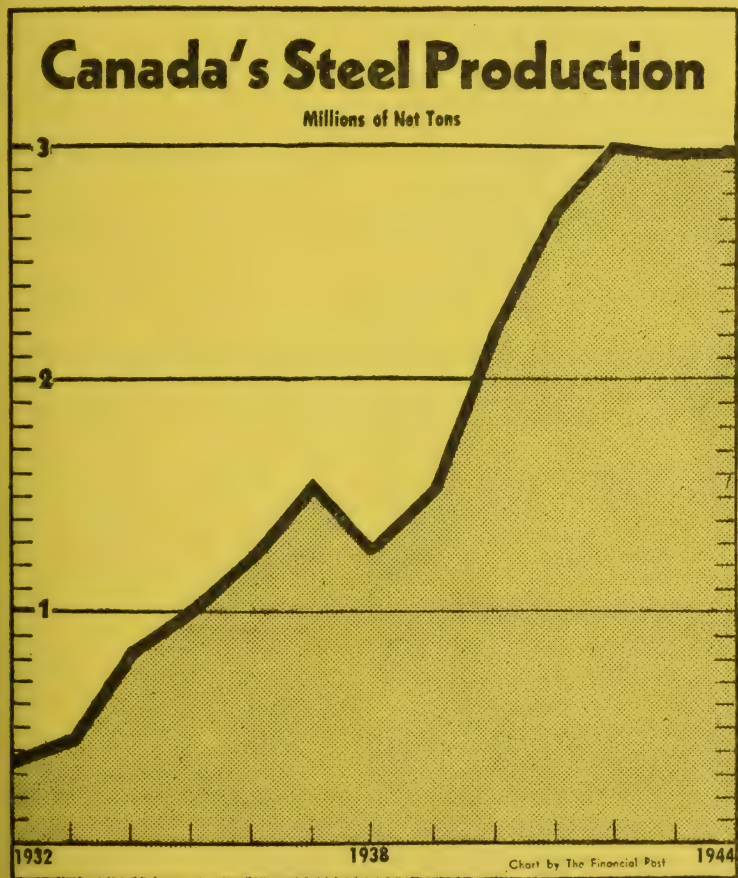
In British Columbia, Privateer Mine and associated interest plan a small steel plant at the location of the former Anyox smelter of Granby Consolidated. This operation, if proceeded with, may result in the mining of one or more of the known B.C. deposits of better grade ore.

Many deposits of iron are known across Canada, but existence of better grade deposits in the United States and relative inaccessibility of Canadian deposits have usually resulted in deferment of development plans. However, with the gradual but steady exhaustion of many of the higher grade deposits south of the border and increased attention being paid to reserves of concentrating ore Canadian iron deposits such as the Iron Mountain deposit in the



udbury area may come in for greater attention.

In eastern Quebec, Hollinger North Shore Exploration Co. has discovered a number of deposits which it is expected will be developed in conjunction with the huge deposits already demonstrated by Labrador Mining & Exploration Co., also under Hollinger control, Newfoundland Labrador.



Canada's yearly capacity for the production of pig iron is now 2,707,760 tons as compared with 1,500,000 tons in 1939—an increase

of about 85%. Three new blast furnaces for the production of pig iron were built, one at Sault Ste. Marie, one at Hamilton, and one at Port Colborne. In addition an unused stack was transferred from Ojibway to Sydney and a small furnace at the Soo was rehabilitated. Two of the new furnaces are capable of producing 1,000 tons of pig iron a day.

The distribution of the present Canadian iron blast furnace capacity is as follows:

	No. of Stacks	Total Annual Capacity (net tons)
DOM. STEEL & COAL .....	4	730,000
CANADIAN FURNACE .....	2	221,760
STEEL CO. OF CANADA .....	3	757,000
ALGOMA STEEL CORP. ....	5	1,062,000
	14	2,770,760

Production in 1944 was 1,852,628 tons or about 69% of rated capacity and was over twice the production of 846,418 tons in 1929 and 71% greater than the 1929 production of 1,080,160 tons.

Steel furnace capacity was also raised substantially to its present rate of 3,623,400 tons a year—a 76% increase over its 2,056,622 tons capacity in 1939. Most striking was the increase of electric furnaces from 44 with an annual capacity of 279,076 tons to 85 with an annual capacity of 786,000 tons. Basic open hearth furnaces were increased to 51 with an annual capacity of 2,825,400 tons as compared with 34 with a capacity of 1,774,946 tons in 1939.

Total production of steel ingots and castings in 1944 was 3,024,400 tons or about 83.5% of rated capacity and was nearly twice the 1929 production of 1,551,054 tons, and over twice the 1929 production of 1,378,024 tons.

One of the most spectacular developments has been the sevenfold increase in the production of alloy steels from 57,583 tons in 1929 to 411,756 tons in 1943. Figures for 1944 show a reduction to 357,000 tons.

Production of ferro-alloys has more than doubled in the last five years. Actual production was 182,428 tons in 1944 compared with 85,000 tons in 1939.



5,540 tons in 1939.

Steel itself is an alloy of iron and a small proportion of carbon—fact which is usually forgotten. The common alloying agents are tungsten, chromium, molybdenum, copper, nickel, and aluminum although there are many more.

In addition to expanding the capacity for making iron and steel, rolling and drawing mills' capacity had to be increased. Some idea of the greatly increased tonnage handled in these mills can be seen from the following comparison of production:

**TOTAL NET TONNAGE MADE**

	1943	1939
Semi-finished rolled forms .....	1,860,988	1,016,452
Rails and rail fastenings .....	305,510	140,972
Wire rods .....	235,583	214,459
Structural steel shapes .....	146,965	81,080
Hot rolled bars .....	598,113	295,150
Cold rolled and cold drawn bars and shapes .....	52,214	12,375
Plates .....	395,298	67,459
Sheet, hoops, bands and strips .....	376,706	162,765
Other rolled forms .....	21,787	13,291
Miscellaneous products .....	79,771	*

\*Not shown.

In spite of the great expansion in productive capacity shown by the above table at least two companies are presently engaged in further expanding their facilities. Dominion Foundries & Steel Ltd. has nearly completed the construction of a new cold reduction rolling mill which will double its cold produced steel and finishing capacity. Steel Co. of Canada now has under construction a new continuous hot strip mill which will have an annual capacity of 300,000 to 400,000 tons of rolled strip and sheets and is planning on the erection of cold reducing mills as soon as possible.

The iron and steel and its products industry group in Canada now includes more than 2,000 factories, representing a capital investment of \$1,825.5 million, employing (in 1943) a monthly average of 45,744 people who were paid \$833.4 million in salaries and wages. That year materials used in manufacturing processes cost \$1,131.9 million, and fuel and electricity cost \$47.3 million.

This is a strikingly different picture from that presented in 1938,

before the war's approach had had much effect on Canada. Then there were only 1,391 plants. Capital investment was only about a third of its present level: \$657 million. Employment averaged 121,235, and salaries and wages totalled \$154 million. Only \$27 million was spent on materials and only \$15 million on fuel and electricity.

Expansion of some description took place in all branches of the industry. Investment in primary iron and steel plants rose from \$10 million to over \$235 million. Employment nearly tripled. Wages rose more than 250%. Machinery plants (excluding farm implements and electrical apparatus) increased in number from 232 in 1938 to 256 in 1943. Investment rose from \$63 million to more than \$12 million. Again, employment nearly tripled, and wages rose close to 400% of their 1938 level.

Here is the group-by-group picture:

	Plants (number)		Capital Employed (\$ millions)		Employment (000)		Salaries & wages (\$ millions)		Gross Value of Product (\$ millions)	
	1943	1938	1943	1938	1943	1938	1943	1938	1943	1938
Primary .....	63	55	235	100	34	13	66	18	224	19
Castings, etc. ....	198	230	60	49	16	11	29	13	75	
Stoves, etc. ....	72	68	20	16	6	5	10	5	28	
Boilers, etc. ....	38	55	25	16	5	3	11	3.7	37	
Farm impl. ....	37	38	62	64	14	6	25	7.5	57	
Machinery .....	256	213	124	63	28	12	53	15	152	
Automobiles .....	5	12	139	60	24	15	58	21	352	1
Auto parts .....	101	97	78	27	22	8	40	9	175	
Bicycles .....	8	4	4	3	.7	.4	1.4	.5	3	
Aircraft .....	45	13	229	9	70	1.6	127	2	246	
Shipbuilding .....	87	41	242	28	76	3.6	154	4.8	377	1
Railway eq. ....	34	37	125	87	30	19	59	27	159	
Wire goods .....	80	77	36	29	7	4	11	5	41	
Sheet metal prod. ....	191	169	78	52	17	8	27	9	97	
Hardware, etc. ....	241	151	63	29	19	6	33	7	91	
Structural steel .....	22	21	39	20	11	3	23	5	73	
Miscellaneous .....	161	134	276	5	49	1.4	95	1.5	365	

Most of the expansion has taken place in Ontario, where more than half of the industry is located. The 787 plants of 1938 have grown to 1,119 by 1943. Capital employed increased from \$4 million to \$1,040 million in Ontario alone. Employment increased



from 75,542 to 222,680, and wages from \$96 million to \$430 million. In the other provinces this is what happened:

Province	Plants (number)		Capital Employed (\$ millions)		Employment (000)		Salaries & wages (\$ millions)		Gross Value of Products (\$ millions)	
	1943	1938	1943	1938	1943	1938	1943	1938	1943	1938
Prince Ed. Is.....	6	5	.8	.5	.3	.08	.3	.06	.9	.2
Nova Scotia.....	71	38	100	31	20	4	36	5	80	20
New Brunswick .....	37	24	18	11	5	1.9	9	2.4	19	6
Quebec .....	424	292	491	139	120	27	229	34	674	108
Ontario .....	1,119	787	1,040	413	223	75	430	96	1,481	369
Manitoba .....	85	53	37	24	10	6	18	8	42	19
Saskatchewan .....	30	19	8.6	4	2	.6	4	.7	10	5
Alberta .....	61	38	18	9	4	2	7.4	2.4	15	5
B.C. & Yukon .....	211	135	138	25	50	3.5	100	4.8	255	15

This is the kind of expansion which made it possible for Canada to turn out more than 750,000 motor vehicles, over 67,000 carriage mountings or equipment, and nearly a million and a half small arms between September 1939 and December 1944.

In peacetime, Canada's iron and steel production capacity, directed by technological control, will make a mighty contribution toward the New America of abundance for all.

EDITOR'S NOTE: *The statistics in this article are taken from the FINANCIAL POST.*

## Petroleum for Posterity

[T MAY be somewhat difficult to realize that a substance which enters so vitally into practically every phase of human existence and enterprise was an unknown quantity in the boyhood of nonagenarians who are still more or less sprightly.

For the first well was drilled for petroleum in 1859 and, in these past eighty-six years, there has been an ever-growing stream of thisunctuous fluid persistently finding its way into every ramification of modern civilization. Industry depends on it; transportation relies on

it; science has harnessed it to many varied, though sometimes obscure uses and, as a climax, it has been a determining factor in the greatest Armageddon of history.

It is not our purpose, at this time, to trace the development of the oil industry from the cradle, but rather to endeavour to estimate how far it has travelled along the road to the grave, for petroleum is a wasting commodity and man has already utilized some 48 billion barrels for his convenience and comfort.

Broadly speaking oil is recovered only from sedimentary rocks and the areas of the earth's surface which comprise this type of strata are relatively well known. Tracing back the antecedents of these sedimentaries, it is possible, from fossil and lithological evidence, to determine which beds were deposited coincidentally and under comparable climatic conditions and, if these conditions were conducive to the formation of oil and gas deposits in one instance, it is logical to assume that Mother Nature worked to a pattern and that the miracle of petroleum was not entirely promiscuous.

All sedimentary rocks are not petroliferous and, perhaps merely to emphasize nature's feminine prerogative, strata which produce oil at one locality may be barren at a location not very far removed that is why we speak of the 'search' for oil. This search has resulted in the drilling of many thousands of wells, some of which produce lavishly, some moderately and some not at all.

After eighty years of oil hunting, now extended over the four divisions of the globe, the oil geologists and engineers have, from these basic considerations, established a yard-stick by which to measure the ultimate world-wide yield of petroleum. They assume that a specified minimum percentage of all sedimentary rocks will be oil bearing; they assume that a certain proportion of all wells will be productive and they assume an average rate of recovery from every successful well. Add these assumptions together, allow a margin for error and you have an estimate of the oil reserves of the world which may be broken down into countries, fields, or even individual properties.

That this is no mere crystal gazing or wishful thinking is evidenced by the fact that a company developing a particular field, ca



with great certainty arrive at an estimate of its ultimate production and predicate its operations accordingly.

It may be desirable to arrive at an understanding of what the word 'reserve' actually implies and the usual acceptance is to refer it to oil in the ground which is recoverable by present known methods of drilling and production, together with oil held in storage. The word is usually qualified by the adjectives 'proven', 'semi-proven' or 'probable'. Proven reserves are those contained in areas where rather intensive drilling has demonstrated the presence and capabilities of certain well-defined producing horizons and where relatively uniform geologic conditions indicate the extent of the pool. Semi-proven reserves would include as yet undrilled areas around or within a producing field, so closely allied geologically that it is reasonable to assume their productivity. Probable reserves would be comprised in areas where, by one method or another, the sub-surface geology has been interpreted as being analogous to productive areas not too far distant.

Turning to the United States, the most drilled country in the world, for an illustration of this reserve theory in practice, we find that the American Petroleum Institute (A.P.I.), estimated U. S. proved oil reserves as amounting to 20,453,231,000 barrels at the close of 1944, an increase of slightly more than 389 million barrels over the previous year. Of this increase roughly 1½ billion barrels was provided by the extension of producing pools and revision of previous estimates, while over half a billion was represented by new discoveries. In the same period 1,678,421,000 barrels was withdrawn from reserves, that being the U. S. 1944 total production, leaving the net gain as stated.

The United States then has a proven reserve of approximately ten years world production at its present level but in the last five years, those reserves have not been appreciated at the same rate as they were in the decade immediately preceding hostilities and the States' reserve position is not considered eminently satisfactory. The reason is not so much a lack of oil, as a lack of men and material to find it for, during the war years, exploratory drilling has been drastically curtailed. Despite this, in 1944, with the discovery of oil in

Alabama, twenty-six of the forty-eight States were oil-producing, and Louisiana and Mississippi, which are relatively new producers, led in the discovery column.

The States' probable reserves are contained in many areas and localities 'where every prospect pleases' and only the opportunity to develop is awaited. Geologists or geophysicists may have been over the ground; core-drilling may have been done; the presence and attitude of oil bearing strata may be a demonstrable fact, but the crucial test of the drill has still to be faced and, pending that, they cannot be considered first line reserves, although their probable value should not be discounted.

The A.P.I. cautiously talks of 'oil that may be present in unknown prospects in regions believed to be generally favourable' and these would constitute 'prospective' reserves. Sedimentary rocks cover about 900 million acres of the States' surface and very many of these acres are still unscratched in the oil search. When conditions permit a renewal of wild-cat drilling on a nation-wide scale, such prospects will not be allowed to lie fallow and although dry holes may be numerous, the oil industry has more successes than failures to its credit and will track the elusive oil to its ultimate lair.

We can add to those prospective reserves the oil that will accrue from the application of secondary methods of recovery in fields where such methods have not yet been practiced; from greater efficiency in these secondary methods which will ensure of a larger percentage being taken from the sands, and from improved technique which will make deeper drilling a more profitable venture.

A further U. S. reserve is Alaska, where oil has already been discovered at one locality and a considerable area of sedimentary rocks has still to be explored. In this region 35,000 square miles is set aside as a Naval Reserve, some indication of the prospective value that is placed upon it.

Although the United States has produced over 60% of the world's production to date, its possibilities are by no means exhausted and seems assured of world leadership for many years to come.

This picture of the United States finds a replica in practically every oil producing country in the world. In all of them development



has been retarded and exploratory drilling restricted by war conditions since 1939. In practically all of them reserves have appreciated, mainly by the extension of proven fields and few large new pools have been discovered. In every country and in many countries which have not yet entered that charmed circle, there are areas of sedimentary origin, more or less vast, which merely await the day when man shall turn from the arts of destruction to peaceful pursuits.

So much oil has already come out of South America that it might almost be considered heresy to say that only the accessible parts of that continent have yet been tapped. Yet when we look at the Llanos of Colombia; the Montana of Peru; the Oriente of Ecuador and the Boliver and Monagas areas of Venezuela, which have only been accorded preliminary surveys and an occasional test, it might safely be asserted that the South American oil industry is only at the beginning of a truly stupendous undertaking.

Brazil ranks second only to the U.S.A., in the Western Hemisphere, in the matter of possible oil producing sedimentaries; Argentina, Bolivia, Chile, Uruguay and Paraguay have basins of sedimentary origin which will undoubtedly repay attention, although it may be that the tendency towards nationalization of petroleum in certain of these countries may retard development.

Mexico, Central America and the West Indies have latent resources either wholly untested or not yet full exploited. Canada is adding yearly to her oil assets as a result of uninterrupted exploration and, as a war development has established a reserve of about 30 million barrels in the North West Territories.

The Dominion's latent resources also include the Athabaska tar sands, from which the extraction and utilization of oil is not yet on a commercial footing. Recognized as one of the greatest surface manifestations of petroleum in the world, the ultimate yield from this source is meanwhile a matter of speculation, to which experimental operations now proceeding may supply an answer.

The area covered by sedimentary rocks in the Eastern Hemisphere is more than double that of its Western counterpart. Vast stretches of the Soviet Union have yet to come within the purview of the oil-seeker and, as Russia controls over one-third of the prospective

producing area on the other side of the world, she should assuredly play an important role in the oil economy of the future.

The basin areas of the Near East exceed those of the U.S.A. and Alaska and the exploratory wells already drilled emphasize their productivity. The Kirkuk field of Iraq is proved along a length of 60 miles; in Iran, on a concession extending for 800 miles, comparatively few wells have already established production in excess of 350,000 barrels daily; in Bahrein, Saudi-Arabia, Kuwait and Egypt war and the lack of transportation facilities have hindered more extensive progress.

Temporarily out of circulation owing to Japanese occupation and devastation, the Netherlands East Indies, which in pre-war years produced around 67 million barrels annually, and Burma with its 9 million barrels, will require extensive rehabilitation before they again become production factors, but in these areas, together with the untapped stretches of China, British India and Australia, lie many promising basin structures which will undoubtedly reward attention.

The world oil situation might then be summed up in this way. Although a tremendous amount of petroleum has already been extracted from the developed areas of the earth's sedimentary basins, these areas still contain proven reserves of considerable dimensions and are capable of expansion by improved secondary methods of recovery.

Areas, greater in extent than the already developed fields and comprising rock formations demonstrated elsewhere as being bituminous, have still to be exploited and, by application of the law of averages, are expected to contain reserves sufficient to meet an expanding world demand for many years.

There is one other and important consideration. Long before there is any indication that the world's petroleum resources are in danger of exhaustion, the industry will have marshalled its synthetic reserves. There are vast accumulations of natural gas, and pressures for their utilization are long past the experimental stage there are colossal deposits of coal and shale from which the extraction of oil is not merely a laboratory demonstration, but a commercial accomplishment. Any appreciable increase in crude prices, such



as would be occasioned by an impending shortage, would immediately be met by development of such synthetic processes, which would at first augment and could, if necessity arose, eventually replace the natural flow of oil.

So we envisage a world of the future in which petroleum, perhaps in new and diverse forms, will play an increasingly important role; we are sanguine as to the availability of adequate sources of supply to meet the needs of generations yet unborn; we are equally confident that the petroleum industry can and will ensure that the vast and complicated industrial mechanism, which oil has done so much to bring into being, will not grind to a standstill for lack of power and lubrication.

—Imperial Oil Review

*EDITOR'S NOTE: Under Price System methods of production, much of our petroleum has been wantonly wasted. Competitive practices have caused billions of cubic feet of gas to be blown off in non-unit operation, making it impossible to recover vast quantities of oil. In the Technate careful conservation of all non-replaceable natural resources will be a primary consideration.*

## *New Tools of Research*

THAT research is the lifeblood of industry was never more widely recognized than today when large sections of Canadian industry are facing reconversion to peacetime production. Much of the country's industrial war strength was built upon years of quiet peacetime research. After the quickening of the nation's heartbeat during the war, research laboratories across the Dominion are preparing to send a new surge of energy through Canada's industrial veins and arteries.

In the swift advance of chemical research, new techniques have been brought to high efficiency, and in many aspects of its work, chemistry has made effective use of machines developed by her sister science, physics.

In the Research and Development Laboratories of Canadian Industries Limited at Beloeil, near Montreal, Que., there are two instruments of which the thirty chemists of the laboratory are particularly proud. They are the x-ray diffraction machine and the spec-

trograph. These 'tools of physics' have been adapted to give tremendous aid to chemical analysis, and according to G. J. Harris, head of the laboratory, analysis comprises 50% of chemical research.

The Beloeil laboratory's x-ray diffraction machine is the only one of its kind used in Canadian chemical industry. According to Dr. F. W. Matthews, who operates the machine, it enables chemists to identify substances quickly and accurately without destroying them, as is necessary in chemical analysis. It has opened the way for scientific investigations which could not have been undertaken a few years ago.

The use of x-ray in diffraction work is somewhat different from its better-known uses. To the layman x-ray usually means shadow pictures of a variety of things, including broken bones, the human chest, flaws in metal. This use of x-ray might be compared with the casting of shadows by sunlight, while x-ray diffraction is more like the phenomenon of the rainbow. Both are interference with a wave motion, the scale of x-ray waves being about 1/1,000th that of light waves.

The object to be analyzed, often only a few tiny particles of matter, is placed in the beam of an x-ray tube. X-rays bouncing from the crystal structure of the substance are permanently recorded on a photographic film, forming a pattern which is as dependable in identifying substances as the fingerprint system in identifying people.

The machine also does extensive texture analysis, that is, the comparison of crystal structures of known substances at different times or under differing conditions. Interesting variations in patterns occur in stretched and unstretched rubber, drawn and undrawn nylon, metals before and after annealing.

Occasionally the machine is given an opportunity to do work of an unusual and spectacular nature. Some months ago a Japanese shell was somehow sent to a Canadian girl as a souvenir. She was shocked when friends discovered that the shell was a live one. The bursting charge was removed, and a sample analyzed by the machine. To the chemist's amazement the pattern was exactly similar to that of the super explosive RDX. This identification was made in a few hours, whereas ordinary methods would have required days.



The spectrograph, whose enlistment in the service of chemistry is also quite recent, works on the principle of the refraction of light waves when passed through a prism. This machine provides photographs of colour bands by which the expert can judge, with amazing accuracy, what the atoms are and the proportionate amount of each in a given material.

While its main use is in analyzing minerals, the spectrograph is so accurate that it has been used even in blood analysis work. Workers engaged in handling lead are sometimes exposed to the danger of lead poisoning. Because the spectrograph detects less than one part of lead in a million parts of blood, it is possible to check the blood of workers and spot the slightest sign of lead poisoning.

Even standard methods of chemistry have taken a new twist at Beloeil, notably in the use of micro-chemical technique. This technique enables analysis and chemical experiment to be conducted on an extremely small scale and makes possible important economies of time and materials. Often a long and complicated experiment will result in no more than a few milligrams of chemical product—about enough to cover the head of a pin.

It is hard for the layman to grasp, but the scale of this work makes it possible to divide a couple of drops of liquid into about eighty fractions, and take the boiling point on each fraction.

Heart and soul of micro-analysis is an extremely sensitive balance which enables the chemists to determine weight differences of as little as five to ten gamma. A gamma is  $1/28,000,000$ th of an ounce.

Before the war the laboratory at Beloeil was mainly a manning depot to provide the various divisions of the company with chemists. Personnel of the laboratory now number 50, and C-I-L has announced an expanding program of research for the postwar years.

—C-I-L Oval

*EDITOR'S NOTE: In the Technate there will be an alert and active research for the development of new processes, equipment, and products. Branches of the Continental research will parallel laterally every Functional Sequence in the social mechanism. These research bodies will have the unique privilege of determining when and where any innovation in current methods shall be used. They will also have the authority to cut in on any operating flow line for experimental purposes when necessary.*

## *Unemployment Areas Appearing*

**L**ABOR 'problem areas,' expected to be the chief headache of re-conversion plans during the next seven or eight months, are already beginning to emerge.

Despite optimistic over-all statements, at least five big Canadian cities are now in the throes of unemployment troubles—Quebec, Montreal, Windsor, Fort William and Winnipeg. Victoria and Vancouver could probably be added to the list.

Toronto is stated to have plenty of jobs but faces a major 'reshuffling' to place warworkers out of jobs in other vacancies. Edmonton and Calgary are described as being in not too difficult straits.

To date, almost one third (32%) of war plant layoffs have been in Quebec province, considered the most critical area. Chief difficulty is the traditional immobility of labor in Quebec. Prior to V-Day, almost 50% of all unemployment insurance claims were in Quebec province. Almost 20% of all the 19,224 Canadian claimants who received unemployment insurance benefits as at July 31, 1945 were from Quebec City.

No very great problems are expected either in the Maritime or in the Prairies. Maritime layoffs so far are said to be only about 1,000 in number. In the Prairies the current demand for harvesters and other seasonal workers on farms is absorbing available workers who 'offer' themselves.

Both Vancouver and Victoria are cited as very difficult problems chiefly because of unwillingness of men who have been laid off, to seek work elsewhere. A publicity and advertising campaign is now under way in those cities, urging men to take work as harvesters and offering to pay the transportation of any men who are willing to go to a job elsewhere. Efforts are also being made to get men and women in Quebec to go to Maine for six weeks work at good wages, helping the harvesting of the Maine potato crop.

—Financial Post



(Continued from Page Eighteen)

may live and produce every material thing that we require. Without it we die. It must be clear that consumable wealth is not like gold or silver which exist in very small quantities in the earth. If gold or any precious metal is the basis of our wealth it must be most painfully true that there is not enough of it to go around. But wealth in the sense of things which we require to make life safe and comfortable has no connection whatever with gold, silver, the Federal Reserve Bank, or the public utterances of Mr. Charles Mitchell. The largest and most important element in the creation of physical wealth is energy. None of the present troubles of this Continent today are caused by the problem of producing physical wealth. The rotting apples in New York and Oregon orchards, the mountains of cotton and wheat, the miles of unused automobiles, the warehouses of shoes are bitter testimony to this fact. The capacity of America to produce physical wealth is such that we are assured of a sufficiency to keep us going for a thousand years with our technological equipment operated on a non-price basis. The sublime

irony of our situation is that we must fight and strangle our competitors to get rid of our products **at a price!** The foundation on which our present-day world stands is built of three things: Discovery, Natural Energy, and, for want of a better term, Watchfulness. Discovery happens from time to time, no man can say when. It is personified in James Watt, Michael Faraday, Thomas Edison, men who gave the world new methods and processes for developing and using energy. These discoveries cannot be predicted, but we do know how completely they can alter the course of history. But the last two, Watchfulness, or the mind that oversees and directs, and Natural Energy must be supplied as long as man and his fellows are to dwell upon the earth.

We have said before that in the past man was the chief engine and—except for his draft animals and a few water wheels and windmills—the only engine. Because that was true, there was a definite limit in mechanical operation beyond which no country or civilization could go. Each social mechanism of the past operated in a particular geographic area which automatically set the up-

per limits of population for that area. Therefore, since man was the only important engine, the amount of work which could be done by that social mechanism was also, automatically limited. There was no way in which the per capita rate of energy flow could be increased after the population had reached the limits prescribed by its physical environment.

It had to be done with a man or it couldn't be done at all. Egypt, Rome, and the empire of Louis XIV were run with one engine of operation—man—who is capable of producing one-tenth of one horsepower for an eight-hour day. Egypt with a population of 5,000,000 souls, of which we may estimate 1,500,000 as adult workers, was capable of 150,000 horsepower on that basis. If the United States were to be shorn of its mechanical power and if we estimate of 120,000,000 inhabitants 36,000,000 to be adult workers we could turn out 3,600,000 horsepower.

That is exactly the way we should have had to estimate our horsepower when the Continental Congress declared our independence of Great Britain. But shortly afterward a new influence

appeared which completely altered the course of our history—the arrival of the machine and the power that drives it. The large single modern turbine has a capacity of 300,000 horsepower, or 3 million times the output of human being on an eight-hour basis. But since that turbine runs twenty-four hours a day, its total output is 9 million times that of one man. In other words, the output of four of these turbines is equal to the energy of all the adult workers of United States. At the present moment the United States has an installed capacity of one billion horsepower of engines for doing work. If these engines were operated continuously at capacity, it would require fifty times the number of adult workers now living on the earth to equal this output by human labor alone. From these figures two things become clear: One is that the importance of man as a worker has dwindled and is dwindling even more rapidly now. The second is that so vital to our national existence has the flow become that if we attempt to stop it and go back to human labor we should die. Agriculture is spoken of as the most important of all our industries, but as



are at present organized only 7% of the energy output of this country is devoted to the direct provision of sustenance. Ninety-three percent is used to keep our social scheme going. And it must be remembered that this flow of energy can be exactly measured as money value, and purchasing power never can. Now let us translate these figures into terms of man and his chance of getting and holding a job. If we consider an industry in this country, we discover that in the beginning employment was small, that it increased as the industry grew until a point was reached where technical improvements began to displace men, where a single machine could do what 5 or 10 or 100 or 500 men did before. In other words, the rate of replacement of men by machines exceeded expansion of the industry. At this point a maximum of employment in the industry was reached and thereafter it declined. It has been observed that in the major industries wherever mechanization has taken place both the man-hours and the energy required per unit produced have been declining continuously. A careful examination of available statistical information reveals

that the high point in the number of industrial workers employed in this country in all industries was reached in 1918 and has with fluctuations declined more and more rapidly since that time. **Production**, however, did not reach its maximum until 1929, so that if we were to translate these two statements into figures and plot them on a graph, we should have two curves. One for production, since 1918 fluctuating ever upward to 1929, and another for employment, since 1918 fluctuating ever downward. The faster, then, that we makes shoes, bottles, blankets, automobiles the fewer men we need to do it and the less mechanical power per shoe, blanket, or bottle is required.

The flour milling industry, for example, had 9,500 plants in 1899, which increased to a maximum of 11,700 mills in 1909, only to decline by 1929 to a meagre 2,900 mills. The workers employed declined from 32,000 in 1899 to 26,400 in 1929. But while the number of plants and the number of workers were declining, the amount of wheat ground was increasing from 471 million bushels ground in 1899 to 546 million bushels ground in 1929.

The steel industry produced 11,000,000 metric tons in 1900, requiring approximately 600,000,000 man-hours. In 1929 the steel industry had a production of 58,000,000 metric tons requiring only 770,000,000 man-hours. In 1900 it required 70 man-hours per ton, while in 1929 only 13 man-hours per ton were necessary.

In 1904 in the automobile industry 1,291 man-hours were required to produce one vehicle. In 1919 the industry manufactured approximately 1,600,000 vehicles requiring 606,409,000 total man-hours, or 313 man-hours per vehicle. In 1929 the industry reached its peak of production. 5,600,000 vehicles were made requiring 521,468,000 man-hours, or 92 man-hours per vehicle. In 1929 we produced 4 million more automobiles than in 1919 with 84,940,000 fewer man-hours in 1929. Its high point of total employment was reached in 1923; both have declined continuously since then.

Observe in the more recent industries how much more rapidly the rise to a maximum of employment has occurred, how quickly the subsequent decline in employment has followed though production increased by leaps and bounds. This last illustrates the

influence of recent technology or machine technique. Where formerly we had men employed in tending machines, we now make a second jump and have machines designed to tend and oversee machines, so that another of the human worker's functions is removed. This might be illustrated by a process now perfected for the manufacture of woolen cloth. Hitherto wool has required repeated handlings, frequently shipment from one plant to another before the washing, fluffing, spinning, and weaving were completed. It is now possible through a straightline automatic process to introduce into one end of a machine the raw wool, wash it, extract the wax and lanolin, fluff the wool, spin it into yarn, dye it, weave it into cloth and cut it in lengths, roll it into bolts and wrap it for shipment. This is the second jump in technology, and its application in one way or another can be seen in practically every industry in this country.

It must not be supposed that this mechanization has halted because of the depression. Rather the reverse. Harassed manufacturers and industrialists, desperate to earn enough to keep the business going and pay the inter-



on their debts, have faster and  
ster adopted more mechanical  
improvements in order to dis-  
pense with labor, cut costs, and  
increase output at a cheaper  
price.

One of the classic examples of  
the marvel of technological effi-  
ciency is the Smith plant at Mil-  
waukee that can, with 208 men,  
turn out 10,000 automobile chas-  
se frames in one day. There are  
many, many more. The mech-  
anical verifiers, sorting machines,  
automatic interpreters, and elec-  
trical tabulating machines of the  
International Business Machines  
Corporation have almost reduced  
bookkeeping and accounting to a  
completely mechanical process.  
We have already spoken of the  
New Jersey rayon factory that  
will eventually require the ser-  
vices of but a single man. It  
would be possible to continue  
such illustrations of this sort,  
showing how in every industry  
technology has swept away the  
human worker, but a few will  
do. The public is already  
well acquainted with teletype in  
telegraph offices. In much the  
same way typesetter sets  
are automatically and simultane-  
ously in any number of cities  
from a master keyboard is oper-

ated in one central place. So,  
it is now possible for a magazine  
printed in Chicago to have last-  
minute news typed out in Chi-  
cago. In a chain system of news-  
papers the fate of the linotype  
operator is plain.

Again there is the photoelectric  
cell, popularly known as the elec-  
tric eye, which can decimate the  
workers' ranks in scores of trades.  
It can detect the imperfections in  
cloth, it can sort articles of almost  
any description. The General  
Electric is now marketing a  
photoelectric cell which can be  
used for almost any sort of control  
purpose. Another application of  
the cell has just annexed the field  
of photo-engraving. Three-color  
plates are produced in half an  
hour over a telephone or tele-  
graph wire at any distance.

The mechanical preparation  
and packaging of groceries is well  
known. Cigarettes so blithely  
advertised as untouched by hu-  
man hand can now be made at the  
rate of two or three thousand per  
minute per man where last year  
only five or six hundred could  
be made. Technology has laid  
its hands upon the building  
trades, and factory fabricated  
houses to be turned out in sec-  
tions and put together with a

socket wrench are about to appear on the market. With each step in technology the stride becomes greater and greater and more and more men are pushed aside. Corporations may do their utmost to hold back inventions that threaten their existence, just as the razor blade manufacturers shudder at the thought of a blade (now existing—but never commercially produced) which will last a lifetime and cost thirty cents; but here and there, faster and faster, technology is breaking through the line.

In the earlier years of this country, when we were reaching out to grasp and exploit a Continent, displaced workers were reabsorbed in the expansion of general industrial development. Machinery and equipment could be made only by hand-tool methods; consequently tremendous numbers could be re-employed. Today the development of a new industry does not mean any considerable increase in national employment except temporarily in its formative stages. The moment an industry reaches a state of complete mechanization

employment drops sharply and always tends to decrease further. It will continue to decrease, times good or bad. In the ray factory referred to, this eventual decrease of employment to a single man will bring it as close to zero as it is possible to come. The production of new equipment for new industry today means a great change in the numbers employed in machine tool fabrication since the same process of mechanization has occurred in the field as elsewhere. Tubing of almost any size can be made through the extrusion process much in the way in which macaroni is made instead of by rolling and welding. Cutting of all sorts has been revolutionized by technology. What as it formerly took three and a half days to cut a crane hook from solid steel, it can now be done from a blueprint in twenty-one minutes. Bolts and nuts can be made automatically. Almost any grinding process may be carried out automatically. And as the machines move forward, men with their trades and skills are left farther and farther behind.

*(Continued Next Month)*

★ BOOM TOWNS AND GHOST CITIES, Okies and slums, are inevitable if the social consequences of technology are neglected. —JOSEPH MINDEL in *Tomorrow*



# The Road To Serfdom'

*Today, we are travelling 'the road to serfdom.' Only by discarding the social accretions that Professor Hayek reveres—the antiquated methods of 7,000 years of scarcity economy—can we enter the New America of physical democracy.*

[N a review of **The Road to Serfdom** Stuart Chase says: . . . Before the postwar world falls down on us, the Vienna school revival might easily go like Technocracy in 1933 . . . Technocracy, however, jumped us a century forward, while Vienna bumps us a century back.'

Author Friedrich A. Hayek has been Professor of Economic Science at the University of London since 1931. He was formerly director of the Austrian Institute for Economic Research and lecturer in economics at the University of Vienna. Along with other German and Austrian scholar exiles of the so-called Vienna School, Professor Hayek has been trying to revive the doctrine of free competition as formulated a century and a half ago by Adam Smith.

The basic assumption of author Hayek's thesis is that economic affairs will always oper-

ate most harmoniously if individuals are left free to pursue their own personal gain. According to this line of metaphysical reasoning, the free play of goods and services will automatically reward individuals as they deserve and magically transform individual self-seeking into the greatest good for the greatest number. 'It was men's submission to the impersonal forces of the market that in the past has made possible the growth of civilization. . . ' (Technocracy would rudely remind Hayek that it was 'men's submission to the impersonal forces of the market' that helped bring about the Great Depression and World War II.)

In the whole book there is scarcely a reference to the technological advancement of the past 150 years and absolutely no recognition of the social implications of technology. Technology has made the North American civilization so highly mechanized, tenuous, and complex that it must

THE ROAD TO SERFDOM is published by the University of Chicago Press.

be controlled by a precision technic: a socially-blind search for profits becomes both murderous and suicidal in the Power Age. Technology—and not 'free enterprise'—has been responsible for the increased standard of living and greater leisure which we enjoy today. If released from the interference of Price System practices, our technology can provide abundance to every citizen of this Continent with the expenditure of only a few hours of effort a day.

Of course, as one might expect with someone who is still living in the age of scarcity of a century and a half ago, Professor Hayek can't accept the fact that abundance for all is possible. 'Whoever talks about potential plenty is either dishonest or does not know what he is talking about.' Would it be unkind to point out to this modern Rip van Winkle that in 1944 (the year in which his book was published) the United States produced about 200 billion dollars' worth of goods and services, or more than twice the national output in 1929?

Our author seldom sullies his dream world of philosophic imponderables with concrete examples or cold facts. That world

is a simple world of black and white, of either-or. In it we must choose between 'planning' and 'freedom.' The Professor never bothers to define what either word actually means.

Yet the book does one service. It indicates the difficulty of 'planning' under a Price System. 'When the government has to determine how many pigs are to be raised or how many buses are to run, which coal mines are to operate, or at what prices shoes are to be sold, these decisions cannot be settled for long periods in advance. They depend inevitably on the circumstances of the moment, and in making such decisions it will always be necessary to balance, one against the other, the interests of various persons and groups. In the end somebody's views will have to decide whose interests are most important, and these views must become part of the law of the land.'

This argument is valid again for any sort of 'planning' under the Price System, but it cannot be applied as a refutation of Technocracy. In the Technate there will be only one 'group' as far as production and distribution are concerned—consumers. Since production will be geared



consumption records—through the use of Energy Certificates and photo-electric technical accounting machines—the consumers will determine themselves automatically what goods are to be made. With the dissolution of the Price system no individual or group will be faced with the problem of setting an arbitrary price on commodities: instead of monetary cost we will have physical cost. For example, the number of ergs of coal, gas, or hydro-electric power expended in producing a pair of shoes and delivering them to the point of consumption constitutes their physical cost).

A technologically controlled social mechanism can grant a physical freedom greater than any ever known in the past, with more 'legal' and 'mental' freedom than we have today. In providing

social security, abundance, leisure, and equal opportunity to all citizens, the technological administration will establish a firm foundation for the greatest civilization in history.

A Price System can be more accurately described as acquisitive than free. It provides freedom to choose, freedom to profit, freedom to operate for private benefit against the public welfare. Price System freedom also means the freedom to have unemployment, poverty, malnutrition, crime, and disease.

Today, we are travelling 'the road to serfdom.' Only by discarding the social accretions that Professor Hayek reveres—the antiquated methods of 7,000 years of scarcity economy—can we enter the New America of physical democracy. —Donald Bruce

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NEW YORK.—Federal Judge Simon H. Rifkind ruled that E. I. DuPont de Nemours and Company, Inc., National Lead Company and Titan Company, Inc., wholly-owned subsidiary of the National Lead Company, formed a combination in restraint of trade. In an opinion in the Government's anti-trust case charging the firms with world monopoly and restraint of trade in the titanium industry, he wrote: 'Whether the form of association they created be called a cartel, international cartel, a patent pool or a "technical and commercial operation" of little consequence. It is a combination and conspiracy in restraint of trade; the restraint is unreasonable.'

—ASSOCIATED PRESS

TODAY WELL OVER 65% of the Canadian people live in the towns and cities, more than 35% on the farms and in the villages. At the beginning of the century the proportions were almost exactly reversed.

—FINANCIAL POST

# The Atomic Revolution

★ **THE ATOMIC BOMB** represents a revolution in science—the greatest revolution ever accomplished. It calls for a comparable revolution in men's thinking and in their capacity for political and social readjustment. Not a hint of that has so far emerged in high places, either here or in Britain. And so far no leader of one of the lesser states, from which the new knowledge has been withheld, has presumed to open his mouth. No one has spoken the simple truth that the exploding atom has exposed to the whole world.

—FREDA KIRCHWEY

★ **SOME WRITERS** have brushed off the need for concrete thinking by assuring the world—and themselves—that a generation may well elapse before atomic energy can be harnessed to industrial tasks. Others have opened vistas of wealth and effortless comfort without bothering to consider what alterations in our society these rewards imply. But the fact is clear, behind all this talk, that soon, too soon for our fuddled social thinking, we shall have available a source of power which must ultimately be cheap if only because it is inexhaustible. What difference does it make whether this power is to be harnessed to planes and factories and heating plants ten years from now or twenty-five? The time in either case will be insufficient to prepare adequately for the impact of the split atom.

—THE NATION

★ **GET TOGETHER, BOYS:** Charles W. Kellogg, president of the Edison Electric Institute, told the *New York Times* on

August 8 that atomic energy would have little effect on the electric light and power industry, since its fuel costs were relatively small anyhow, and intimate that prices would not be materially reduced. In the same story an unidentified representative of the electric companies was quoted as asking, 'What's the use of the government embarking on further expensive hydro-electric projects when the future of power production is about to be revolutionized?'

★ **REPRIEVE:** The August 11 bulletin of the Chamber of Commerce of the United States had this to say about splitting of the atom: 'With the knowledge that this energy cannot at once be used for purposes other than destructive immediate jeopardy to our economy, we are not in sight.'

★ **DURING THE DECADE** before war, the more advanced industrial countries already had the technical knowledge to produce enough to abolish poverty. They did not, however, have the ability to distribute what they could produce. What we need in order to benefit from the release of atomic energy is almost exactly what we needed to benefit from internal-combustion engines and all other improvements in our production. The need was very imperfectly fulfilled by existing human institutions. The potentialities of atomic energy are therefore like its military potentialities—that they have intensified a challenge to increase our understanding of human society and to improve its organization.

—THE NEW REPUBLIC



# Jobs for All?

*In two world wars we have had full production, full distribution, and full employment. We cannot have any of these in peacetime under the Price System, for only in time of war can we find a profitable market for all the goods we produce.*

If we want to understand why the prewar capitalistic system never supply full employment for everybody we have to consider the basis on which it is built.

Profit makes the wheels of capitalism go round. Unless there is a certainty of profit new businesses will not start up. Unless there is a guarantee against loss a business cannot stay long in business. Hence all the slogans of the world, and all the good will in the world won't maintain full production under capitalism when the conditions which make full production profitable are not present.

If we examine what has happened during the lifetime of most of us we can easily see what makes the capitalistic system stop and start. We can see what makes it slow down and speed up. In two world wars we have had

full production. We have had full distribution. Between the two world wars we never did have full production. We never did have full distribution even of what we had produced. We burned wheat and coffee, killed little pigs, plowed under cotton. We did not have full production in the depression period because the owners of big business enterprises were not such idiots as to keep on producing goods for which there was no profitable market. The absolute necessity for full production is a guaranteed total market for everything that can be produced. Under the price and profit system capitalism alone can only supply this absolute necessity during times of war. Because only in war can all of the things which the capitalistic system is capable of producing be distributed without swamping the price system—and without sweeping away in a flood of bankruptcy many existing businesses.

There are two general kinds of

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goods which any modern society produces. The ordinary necessities of life are called consumers' goods. The heavy machinery—the factories, the power plants and so on—all these are called producers' goods.

To create the condition which make possible total production and total distribution it is necessary to have both a total market for all the consumers' goods which a country can produce and also a total market for all of the producers' goods which a modern country can create.

The capitalistic system by itself can only meet these conditions in times of war. For only in times of war can a modern industrial country, working under the capitalistic system alone, find a profitable market for all of the heavy goods which it can produce.

There is a great unlimited market in any and every country for consumers' goods and for services which the people themselves need and want but cannot get. But under the prewar capitalistic system only a fraction of the people of any given country can get all of the goods and services they want and need, for their wages are dependent on the successful working of the capitalistic

system as a whole.

At least a hundred economists of world-wide repute have put their finger on the key flaw in the capitalistic system. That is the market for the heavy goods which the system can create operates on a stop-and-go basis.

When there is a sure, total market for all the heavy goods that the country can produce the wheels begin to roll and the stuff pours out of the factory at a rate that is really stupendous. But in time of peace it is only in the boom periods that the capital goods industries operate anywhere near total capacity.

When the capital goods industries lack a complete market what they can produce then naturally slow down to the level of the buying in sight. When they slow down they naturally reduce their payrolls—that is, they throw people out of work. They throw people out of work not because they are cruel, heless gangsters, but because they are good business men. They have to throw some people out of work, in such circumstances, or else go broke and see their entire organization close down.

As these organizations cut their pay rolls the people thrown



ut of jobs have their own purchasing power reduced. They in turn cannot purchase even the necessities and comforts of life to which they were accustomed. Thus the market for heavy goods made in cities has a direct and vital connection with the market for farm produce and so on. When the market for big business falls if the little man is hurt, too—or if there are fewer employees of big business able to purchase his produce.

Most economists state the weakness in slightly different manner. They say that depressions occur at any period when total savings are greater than total investments.

That is just a high falutin' way of saying that you have to keep money fully employed if you are going to keep the people fully employed. You have to keep the little man's money fully employed. And you have to keep the big man's money employed.

The ordinary families of Canada and other countries always do their share to keep the wheels of business turning. At least 90 percent of all the people are compelled to spend almost all they receive just in order to keep going.

True, the ordinary people do accumulate considerable savings in the form of bank deposits, bonds, and life insurance. But our society is so organized that in so far as these savings of the little people have effect on the economic system they might just as well be in the bank accounts of the big fellows in St. James Street, Montreal, or Bay Street in Toronto. For the investment policies of the insurance companies and the lending policies of the banks are absolutely controlled from those two centres.

It is not the 90 percent of the ordinary people whose spending, or lack of spending, causes the stops and goes, the booms and depressions, in the capitalistic system. Rather it is the one-tenth of the population which controls, directly or indirectly, the investments of Canada.

It is not little money but big money which operates the stop-and-go signal for the heavy industry. It is big money which slows down or speeds up the heavy goods industries. But it is a gross mistake to think that there is any moral difference between the little man and the big man in this respect. Both are compelled to do under the stern

laws of our economic system exactly what they do do.

Until we change the system to make it possible for individuals to act otherwise than they now

have to act, it is idle to rant at the rich. It is not persons but the system which is to blame:

—Elmore Philpott

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★ CANADA'S NATURAL RESOURCES in salt are abundant and the production of the mineral is one of the Dominion's oldest non-metallic industries. Early in the 19th century the Hudson's Bay Company obtained its local supplies from the brine springs of the Mackenzie Basin. However, the real birth of the industry occurred with the discovery of salt in Ontario in 1866. Salt is produced from wells in Ontario, Manitoba and Saskatchewan, while in Nova Scotia the mineral is mined as rock salt. The production of salt in Canada in 1944 amounted to 717,000 tons valued at \$3,921,000.

—DOMINION BUREAU OF STATISTICS

★ TWO ELECTRIC MOTORS developed recently at a U. S. Army laboratory are incredibly small compared with regular motors of the same horsepower, because they operate on a 400-cycle frequency instead of the standard 60-cycle frequency. One develops three horsepower, weighs only four pounds instead of the usual hundred pounds; the other of seven horsepower, weighs thirteen pounds instead of two hundred pounds.

—SCT. D. J. CROSS, WRIGHT FIELD, OHIO

★ THE BRAVE, BRIGHT POSTWAR WORLD about which Canadians have heard so much was already here—and so far looked neither brave nor bright. Though Canada still had a surplus of jobs, continued layoffs of war workers and the steady return of discharged servicemen would probably eliminate the surplus before the summer's end. What then?

—THE

★ TEXTILES ARE FABRICS produced by the weaving or knitting of material into cloth. This is probably one of the oldest known industries; older than man in fact, since it was practised by spiders, caterpillars and birds before the advent of the human race. At the dawn of history, wool, cotton, silk and flax were being woven in the East with great skill, while in North and South America, the Peruvian Incas and Mayas of antiquity produced textiles and beauty and fineness. To this industry is highly developed in many lands. The production of textiles and textile products constitutes an important branch of Canadian manufacture, the gross value of which amounted to \$793,305,000 in 1942. The war years have witnessed a striking expansion in the Canadian industry, the value in 1939 having been \$392,658,000.

—DOMINION BUREAU OF STATISTICS

★ A REFORMER was watching a trench being dug by modern machine method. He said to the superintendent:

"This machine has taken jobs from scores of men. Why don't you scrap that machine and put one hundred men in that ditch with shovels?"

The superintendent promptly retorted: "Oh, better still, why not put a thousand men in there with teaspoons?"

—CALGARY ALBERTA



# Notes On Organization

*Science, when she has accomplished all her triumphs in her order, will still have to go back, when the time comes, to assist in building up a new creed by which man can live. . . .*

—JAMES MORLEY, *British Statesman and Author*—1838-1923

TECHNOCRACY Inc. now has its Sections widespread over the whole Continent, each Section with a membership of twenty-five or more. The members represent citizens of all types and origins whose training has been in every known field of human endeavour, but they possess in common the one desire to put their shoulders to the wheel and, each of his own capacity, aid in the growth of an Organization which will lead finally to a social mechanism guaranteeing opportunity and security for all alike. In any other day and age, this would be labeled Utopia, or an idle dream, but today the undeniable facts of technological advance and abundant resources make the attainment of this goal a strong probability which, however, must be held in abeyance until a mandate of a prepared people shall declare it in operation.

World War II has produced a technological revolution on this Continent

which has changed the entire basis of our society. We cannot cope with the problems of the peace unless we introduce a total mobilization in United States and Canada competent to operate the totality of our enormous productive mechanism.

The conviction pronounced by the business reactionary and the intellectual liberal alike is that if, in the postwar, we abandon 'free enterprise' there are only two other alternatives—fascism or communism. But the technology of North America decrees another destiny for this Continent—a non-price technological operation which is neither fascism nor communism nor a descendant of the North American business system. Technocracy knows that this Continent can realize the great and revolutionary concepts of Freedom from Want, Freedom from Fear, Freedom of Speech, and Freedom of Religion—but not within the framework of the Price System. They cannot be achieved with a General Motors Postwar Master Plan nor with a Baruch Report.

The activities of the Sections of Technocracy Inc. have been chiefly those of education in the principles and plans of Technocracy, development of leadership, and interesting others in becoming

ing members. Now, in the face of national emergencies of war and the unsolved problems of the postwar era, Technocracy is engaged in consistently, unceasingly—even increasingly—urging the adoption of its immediate program of Total Conscription. To some who are endowed with an excess of restless energy, this unspectacular course of preparations for a scientific society, this unceasing interest in the wartime emergencies, has seemed slow and unprofitable. Schooled since birth in a political world of chicanery where showy rhetoric and sounding phrases are the rallying call for action, these individuals chafe at what seems to them unwarranted delay. With vote in hand, they fretfully proclaim their wish to charge forth to the battle, feeling secure in the thought that because they are basically correct

in their concepts, the machinery for operating a scientific society will miraculously appear when once the system is publicly approved.

To these, and a few others who believe that their work is completed when they join Technocracy Inc. and do a little superficial studying and reading, the only answer is that they must quickly awake to the fact that the most significant struggle in history is under way, and that the outcome is still uncertain. If those, who already know that a scientifically operated Continent is all that can save us, fail in their work to distance themselves from their fellow citizens of the fact and to aid in preparing the way for what is coming, then we shall all alike, the workers and the shirkers, sink lower into misanthropy and finally into chaos.

---

★ CORPORATE ORGANIZATION POCKETED PRODUCTION; its giant spring is pocketing the nation, including the entire lives of its citizens. And organized business is extending this anti-democratic web of power in the name of the people's own values, with billboards proclaiming 'What's Good for Industry is Good for Your Family,' and deftly selling itself to a harassed people as 'trustees,' 'guardians,' 'the people's managers' of the public interest. —PROFESSOR ROBERT S. L.

★ OTTAWA.—Productive operations for the first five months of this year were lower than in the corresponding period of 1944, the Dominion Bureau of Statistics reports. The index of physical volume of business declined to 224.3 during the period, compared with the figure of 243.5 in the first five months of 1944. Index of production dropped from 276.0 to 244.9, while the cost of living declined from 117.1 to 117.1. —CANADIAN PRESS



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. Encyclopedia Americana says: 'Whatever the future of Technocracy, we must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, physicist (now Federal Power Commissioner); Benton Mackaye, now in the Forestry Department); Charles P. Steinmetz and Thorstein Bunde (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundation of the present Continental membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly, well-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves into an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Let's Declare War on Peace!

*NORTH AMERICA'S WAR is here and now, in this country and on this Continent—a patriotic war against the peace of this Price System, against its poverty and its malnutrition, its crime, its sudden death, and its disease. It is a war of plenty versus poverty, of technology versus toil, the war of tomorrow against yesterday, of science versus chaos.*

*War ends in victory or defeat, but the peace of this Price System has no end, merely disintegration. So let's offer the youth of this Continent a new war, a fight worthwhile, a battle royal, a war to fulfill this Continent's rendezvous with destiny. Let's declare war on peace, the peace of this Price System.*

—HOWARD SCOTT

(SECTION STAMP)



# **TECHNOCRACY DIGEST**

**The Tory Conservatives of Great Britain**

**The British Labor Party**

**The Passing of Politics**

**No Help Wanted!**

**Blood, Sweat and Profits**

**The St. Lawrence Project**

**Automatic Wood Prefabrication**

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# TECHNOCRACY DIGEST

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COUNTRY FOR SOCIAL CHANGE

NOVEMBER, 1945

VANCOUVER, B. C.

No. 8

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# No Help Wanted!

*Stimulated by the biggest shot in the arm in history and drunk with the greatest prosperity ever known, the citizens of this Continent have been on a glorious binge for the past six years. Now comes the cold bleak morning after.*

WITH the coming of peace, the 'classic crutch of war' has been kicked out from under the North American Price System. Canada and the United States not only face the old pre-war social problems but the same problems in more violent form.

While other countries emerge from the ruins appalled by their poverty, we are baffled by our abundance. While other nations will need the toil of every man, woman, and child to keep them from starvation, we are already confronted with a surplus of millions of unwanted citizens.

The U. S. War Manpower Commission estimated on the basis of telegraphic reports from 73 representative labor markets that some 2,000,000 war workers were laid off during the first 10 days of peace.

Official Government predictions are 6,000,000 jobless by December and 8,000,000 by March. In the highest estimate to date an OPA economist has forecast 10,000,000

unemployed by June.

The U. S. Bureau of Foreign and Domestic Commerce has compiled information which indicates that if postwar output should be no greater than it was in 1940 (when the American economy was already stimulated by war orders) 'there would be the 9,000,000 who were unemployed in 1940 plus the 2,500,000 added to the civilian labor force between 1940 and 1946 plus 8,000,000 who would be displaced by improvements in efficiency over the six years—a total of over 19,000,000 unemployed.'

The Mead committee, in its new report on reconversion problems, estimates that the U.S. must find 11,000,000 more jobs than in 1929, which is 6,000,000 more than the present civilian labor force. Not only must employment in the manufacturing industries be held at its gain of 5,000,000 more than in 1929 or 1939, says the committee, but work must be found for 6,000,000 additional persons.

In 1944 the United States produced close to \$200 billion of goods and services (more than twice the national output in 1929). It achieved this production without the efforts of about 12,000,000 of her most able-bodied citizens who were in the Armed Forces.

The same year Canada's gross national product was \$11,500,000,000 (compared to \$5,000,000,000 in 1938), with some 750,000 persons in the Armed Forces. Approximately 60,000 young Canadians leave school every year to join the labor pool, and technological improvements which displace human toil are on the in-

crease. How, then, can we expect to provide work for all citizens on an annual demand for goods and services of \$10,000,000,000, the figure which has been suggested as a full employment guarantee by Canadian politicians and businessmen?

World War II has been one last wild fling for the North American Price System. Stimulated by the biggest shot in the arm in history and drunk with the greatest prosperity ever known, the citizens of this Continent have been on a glorious binge for the past six years. Now comes the cold bleak morning after.

—The Editor

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★ WASHINGTON, Oct. 1—John W. Snyder said today there may be 8,000,000 unemployed in the United States by next spring with 'high unemployment' persisting through 1946. Mr. Snyder's forecast was based on the contention that job-giving will be unable to keep pace with a prospective million-a-month demobilization.

—VANCOUVER DAILY PROVINCE

★ TORONTO, Oct. 1—Clarence Gillis, C. C. F. member of Parliament for Cap Breton North, last night told a meeting here two confidential surveys by the federal labor department showed by the end of 1945 'there will be 500,000 people unemployed in this country, for which there is no solution.'

—CANADIAN PRESS

★ JUST BEFORE THE WAR there were three and three-quarter million people gainfully employed in Canada. But if we can't employ more than that number after the war, there will be nearly a million energetic men and women clamoring for work. To employ them we shall need 25% more jobs than existed in 1939. To provide these jobs—and a decent standard of living—we may have to increase our total pre-war production by close to 50%.

—CANADIAN AFFAIRS

★ IT HAS LONG been a commonplace that man's development of new mechanical techniques has far outstripped his development of the social techniques necessary to master them. Nor has there been any sign that this disproportion has been decreasing; rather the reverse.

—COMMON SENSE



# The Tory Conservatives of Great Britain

*Never has any political party in the history of the English speaking world achieved such a long record of vicious intrigue and collaboration with the national and international enemies of the general welfare of mankind . . . The Tories of Great Britain number among their elite a long list of successful collaborators who undoubtedly will never face a court . . .*

TIME ran out for European fascism in Berlin on May 9; time ran out for the Tory Conservative Party of Great Britain on July 25; time is running out for fascism in Asia. Japan will shortly negotiate her capitulation. Time is running out on the war and soon there will be established that politically arranged armistice between armed conflicts, sometimes called peace. World War II against fascism has lasted almost six years. Six years of military conflict have brought death and devastation, disease, starvation and malnutrition to millions of square miles of the earth's surface and hundreds of millions of human beings. Six years of war have dismantled and destroyed the prewar Governments of Germany, Italy, Japan, Hungary, Rumania, Bulgaria, Yugoslavia, Poland, Finland, Greece, France and Belgium. The end of the war in Europe also brought to

an end the ten year Tory Government and the Prime Ministry of Winston Churchill. The war Government of Canada under the Liberal Party and the leadership of Mackenzie King is tottering into decadent political fragmentation and economic dislocation.

This war has brought death and desolation, and economic and political havoc to many of the countries involved, but to Canada and the United States in particular, and to a lesser extent Australia, South Africa and India, it has brought the questionable blessing of a stultifying prosperity. Some nations have known the bitterness of defeat and economic chaos; Britain and Russia have known the great resurgence of victory and the high elation that comes to a nation that finally emerges victorious over its enemies; but the United States and Canada, even though suffering over a million casualties in battle,

have on the home front been the recipients of the greatest lush prosperity ever known in history.

In Europe the guns are still. The military conflict has ceased, but out of the ashes of the war and its debris in all countries there is arising the spirit of a new age, a trend away from yesterday, a departure from the traditional values of history. In Europe, the conflict of war has torn down the supporting columns of the previous social structures. All over the world a new political trend has set in, a trend that is Left of everything that was. Only the United States exhibits a contrary trend. Here Big Business has become so big that politics has become 'Mr. Big' too. Of all the great powers only the United States is pursuing a national policy of preserving yesterday's obsolescence. In Europe, the Government of the U.S.S.R. has moved the orbit of its power westward to where it now stretches from Lubeck on the Baltic to Trieste on the Adriatic and includes over half of Germany. Such an extension of Russian domination has already terminated the possibility of free enterprise and its political machinations east of this western bound-

ary of the Cordon Rouge.

The British Labor Party has swept into power with 390 of the 640 seats in the British House of Commons on the political program of nationalization of the coal mines, the steel industry, the public utilities, all forms of inland transportation and the Bank of England. British foreign trade will no longer be the concern of competitive private enterprise but will be managed by the Government of Great Britain as a matter of national economic concern. France has already announced the nationalization of the coal mines and other utilities. France too has proclaimed that her foreign trade will be operated as an economic division of her national Government. France will hold her first election on October 14, and the trend here is also to be Left. Britain, politically moving to the Left in her July elections, will further implement the same political trends in France and other countries of Europe. The people of Great Britain are far to the Left of the political position of the British Labor Party; the people of France are far to the Left of the existing provisional Government of France. With foreign trade in



Great Britain and France becoming practically an economic subsidiary arm of the political Government, Belgium and Holland will automatically be compelled to follow suit. Free enterprise in Europe is living on borrowed time. Nationalization is on its way in. As industry, transportation, communication, mining and credit are nationalized, the old order must recede. In Europe, as the old order recedes, out of the chaos of war and its social debris the structural forms of a new social operation are becoming visible; in the United States and Canada, out of the hogwash of their war prosperity, there emerges a reactionaryism as destructive to social progress as the fascism of Europe and Asia that has just been defeated on the field of battle.

In Europe and Asia, the fascist governments have been overthrown by the military might of the Allies. They have joined the social debris of the war. This has been no shock and was expected by the public of this Continent, but the public of this Continent is disturbed to find that the political leadership of the war governments of most of the Allies is sliding into oblivion. Winston Church-

hill has already passed, Mackenzie King of Canada is partly eclipsed and will probably go down as one of the 'also rans' within the coming year. Charles de Gaulle of France and Chiang Kai-shek of China have at least one thing in common—the days of their political future are numbered. The great war leader of the United States, Franklin D. Roosevelt, was elected to a fourth term and died in office to be succeeded by Harry Truman and a revamped Democratic Party. Only Soviet Russia has come through the war with the structure of its national Government and its leadership unchanged.

The campaign of fulsome praise conducted nationwide by the 'free press' of the United States has led the American public to believe that the great Tory war leader of Great Britain went down to defeat in the July election because of the base ingratitude of the majority of the British population. The 'free press' of the United States has vehemently proclaimed that only an ungrateful nation could politically discredit such a glorious war leader as Winston Churchill and turn from support of his high purpose to the horrors of nationalization

by giving a political mandate to those labor union Leftists the Labor Party of Great Britain. Socially and politically there have always been two Britains, one of the rich and one of the poor. The Britain of the rich has always been represented by the Tory Conservatives of the Right; the Britain of the poor has practically never had any political representation until the advent of the Labor Party and a collection of other assorted parties of the Left. The Labor Party is the chief representative of that majority—the Britain of the poor.

There was nothing ungrateful in the overwhelming political defeat which the British public administered to the Tory Conservative Party and its leader, Winston Churchill, but it is regrettable that it did not occur forty years ago. For the first time in ten years the British public had an opportunity to present their verdict at the polls and their verdict was a thunderous 'no' to all the flimsy pretensions of the Tory political bombast. The Tory Party of Great Britain since December, 1917, has seemed to possess an almost indissoluble relationship with the fascism of Italy, Germany, Spain and

France. Sir Samuel Hoare was Foreign Secretary to the Baldwin Conservative Government. I was Sir Samuel Hoare, Pierre Laval and Benito Mussolini who mutually arranged on a plane of high amity the conquest of Abyssinia as a colonial appeasement to fascist Italy and to the roaring wolves of Mussolini's fighting forces. This incident was of course so raw that even the Tories of Britain were compelled to remove Stanley Baldwin as Prime Minister and replace him with Neville Chamberlain and his umbrella. Sir Samuel Hoare, of course, was British Ambassador to Spain through those long years of British dishonor when the Tory Government of Britain openly supported fascist Franco and his Falangists in the Civil War in Spain. Neville Chamberlain, his Foreign Secretary, Lord Halifax and the Tory Party sold Czechoslovakia down the river. England along with France, declined to join with Russia and failed to keep her treaty promises in guaranteeing the territorial integrity of Czechoslovakia.

It was Tory England that finally went to war with Germany in defence of fascist Poland. It was Tory England that supported



King Peter and Mikailovich in open warfare against Marshall Tito and his Partisans. The Partisans of Yugoslavia will forever remember Prime Minister Churchill and his son, Major Randolph Churchill. It was Tory Britain that supported the interests of King George of Greece and his fascist friends during and after the European War. This Tory interest in maintaining the reactionaries of Greece could possibly be interpreted as Churchillian gratitude in remembrance of Hambronian beneficence. It was Tory Britain that throughout the war upheld the royal house of Belgium and that after the war with British tanks, forced a reactionary decision on the Belgian Parliament. It was Tory Britain, in conjunction with the United States, that salvaged the House of Savoy and all the fascist nobility through their stooge, Marshall Badoglio. It was Tory Britain, in conjunction with the United States, that dealt with Marshall Pétain and Pierre Laval throughout the nefarious career of Vichy France, with the able cooperation of Admiral Leahy, Robert Murphy, William Bullitt, et al. It was Tory Britain that throughout six years of World War II main-

tained amicable and helpful relations with the fascist Governments of Salazar and Franco. It was Tory Britain that maintained throughout the war the fascist Polish Government-in-Exile to the tune of hundreds of millions of pounds. It was Tory Britain that permitted the fascist Polish Government-in-Exile to carry on its treacherous intrigue with Germany and Polish reactionaries to the detriment of her Russian ally.

Never has any political party in the history of the English speaking world achieved such a long record of vicious intrigue and collaboration with the national and international enemies of the general welfare of mankind. In European countries, political leaders are being brought to trial charged with collaboration with fascism, conspiracy with the enemy, and crimes against the state. The European courts have tried and found guilty a considerable number of the political leaders of prewar and war Europe and the sentences of the courts have been carried out, mostly by life imprisonment or death. The Tories of Great Britain number among their elite a long list of successful collaborators who un-

doubtedly will never face a court, but who will be recipients of British gratitude by having conferred upon them honors and official

position for further service in the Empire on which the sun never sets.

CHQ, Technocracy Inc., Aug. 30

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★ THE EXTRAORDINARY AGRICULTURAL PRODUCTION (in the last four years) was achieved in the face of very strong and dangerous campaigns, by some farm and food trade groups, to curtail production . . . The reason for the desire to cut down on output was fear of postwar 'surpluses,' the panic impulse toward scarcity as against abundance, price maintenance as against volume.

Nevertheless, production went up and up—of beef and veal by 1.7 billion pounds, of pork by 6 billion pounds, of eggs by 1.6 billion dozen, of corn by 70 million bushels, and so on down the line. Consumption also went up—and this is even more significant for the future. Even with rationing, even with diversion of huge quantities for military and lend-lease purposes, civilian consumption of pork and lard jumped from 67.1 to 87.1 pounds per person; of chickens from 17.9 to 28.1 of wool from 4.5 to 7.7; of cotton from 25.3 to 39.8.

—COMMON SENSE

★ THE U. S. DEPARTMENT OF COMMERCE has said that American business simply cannot afford a severe depression. Consolidated sales of private business in United States dropped from \$93 billion in 1929 to \$48 billion in 1933. Between 1929 and 1941, it estimated that the accumulated loss of consolidated sales resulting from conditions of less than full employment had been \$350 billion. Corporate profits after taxation of \$7.2 billion in 1929 were wiped out and replaced by losses of \$3.6 billion by 1932. Earnings of unincorporated businesses and proprietors, not including agriculture, collapsed in the same period from \$8.5 billion to \$3.4 billion.

★ IN 1929 the cost of living (in the United States) was 119. (The average for the five years from 1935 through 1939 is taken as being equal to 100.) It fell to 92; the bottom of the Great Depression, and it had risen to a little more than 99 in 1939 when the war began. Since then there has been an increase each year, and the average for 1944 was slightly over 125, or 25% above the figure for 1939.

—CLEVELAND TRUST COMPANY BUSINESS BULLETIN

★ BEFORE IT (the war) the world was not happy and prosperous. It was in confusion, part way along in a revolution made necessary by the release of advanced techniques of production in a society mainly governed by antiquated concepts and institutions. This confusion, and the lack of preparation to organize the new situation for human welfare, gave rise to hostilities and uncertainties which themselves prepared the ground for the war itself.

—THE NEW REPUBLIC

★ IN A SARDONIC SENSE, the sudden surrender of Japan may well be regarded as its reprisal for atomic bombing. We were poorly enough prepared for a slow and comfortable period in which we could devote half our energies to the war in the Pacific and half to the resumption of large-scale civilian output. We are completely unprepared for a Japanese collapse, and unless we act quickly and wisely may face an economic collapse ourselves.

—I. F. STONE in *The Nation*

★ IN WORLD WAR I, the interest rate on government securities rose from 2.1 to 4.22%; but in this war it has fallen from 2.53 to 1.94% —CANADIAN BUSINESS



# The British Labor Party

*Social change from one order to another can never be partial; it must be total to succeed. Anything less than total will create a counterrevolution led by a British Kerensky. The Labor Party of Great Britain can succeed in its program of nationalization only if it installs a total conscription of men, machines, materiel and money within the British Isles . . .*

THE Labor Party for the first time in the political history of Great Britain has been swept into power with an overwhelming majority in the House of Commons. The British Labor Party was voted into power by the British public on the party program of nationalization, a nationalization of the coal mines, all inland transport, public utilities, steel industry and the Bank of England. The new Prime Minister of Great Britain, Clement Attlee, has defined the Labor Party program as socialism. Professor Harold Laski, Chairman of the Executive Committee of the British Labor Party, has proclaimed the Labor Party's victory to be 'revolution by consent.' The Labor Party program also calls for reformist measures in housing, public health, unemployment benefits, and old age security. One of its chief contentions is that Great Britain under the

socialist program of the Labor Party can accomplish full employment and greater production and thereby provide a higher standard of living for 'the common man' of the British people. Technocracy does not doubt or question the sincerity of the leadership of the British Labor Party, but it does question the national conditioning out of which springs the parliamentarians of the Labor Party and the Tories alike.

What does the British Labor Party mean by nationalization? Does the nationalization program mean expropriation of the existing ownership, or does it mean that the British Government will pay in cash and bonds amounts sufficiently large to indemnify the owners of the mines, the steel plants, the public utilities, the inland transport system and the Bank of England against any financial loss? The press of the

United States has hastened to assure the American public that the nationalization program of the British Labor Party need cause no undue fears in Canada or the United States, as they interpret the program to be not one of expropriation but one of gradual indemnification. The British people are already carrying a huge tax load. If the nationalization program is to be one of indemnification, then it is nothing but outright purchase by the British of properties now held by individuals and corporations.

If this is the plan, then the purchase price would impose on the British people an additional economic load as staggering as the national debt that they now carry. If the British Labor Party is actually going to attempt Government ownership by Government purchase of private and corporate property, it will become the greatest sellout of the British people in their entire history. Political programs that propose to legislate social change into the structure of any national economy through the gradualism of financial indemnification are in reality but well-laid schemes to feather the bed of political parliamentarians and their beneficiaries. Un-

less the Labor Government of Great Britain moves swiftly with its political power to enact immediate expropriation clear and outright without a penny of indemnification, delay and sabotage will occur.

Social change from one order to another can never be partial; it must be total to succeed. Any thing less than total will create a counterrevolution led by a British Kerensky. The Labor Party of Great Britain can succeed in its program of nationalization only if it installs a total conscription of men, machines, materiel, and money within the British Isles placing the entirety on a basis of national service from all with profits to none, and temporarily operating its external holdings on the present basis of foreign trade and exchange. If the Labor Government of Great Britain attempts to install its program of nationalization piecemeal while it pay off the existing owners in Government bonds, it will incur great hazards, confusion and delay which would be avoided by the installation of the more drastic program of national service by total conscription.

If the Labor Government of Great Britain is going to permit



the Tories to remain in possession of economic power in the British Isles, then it might as well be prepared to face all the sabotage of a class civil war with the Tories receiving aid and succor from the United States and other countries. Is the Labor Government of Great Britain so fatuous and naive as to believe that social change can be accomplished in the British Isles with the nobility, the landed gentry, and the Tories still in possession of economic and political power? Unless the Labor Party of Great Britain acts swiftly, the conspiracy will be in operation to defeat all their intentions for the common good and the general welfare of the British people. No modern industrial nation can remain half Tory and half nationalized.

It is interesting to note that the Labor Prime Minister, Clement Attlee, is a graduate of Oxford, a lawyer, an ex-mayor, and that he has been elected to political office for over twenty years. Sir Stafford Cripps and Hugh Dalton are prominent lawyers, and other members of the Cabinet run the gamut from labor leaders to intellectuals, most of them political officeholders of long standing. There is not a scientist, technolo-

gist or engineer in the ranks of their leadership. Their background might be described as differing from that of the Tories only in that in their case it produced parliamentarians of the Left instead of parliamentarians of the Right. Both have sought office, both have attained office up until now. The Tories have been the most successful in holding office. The near future will tell whether the Labor Party parliamentarians will make all the compromises of expediency necessary to emulate the Tory record in political office.

The British Labor Party as the Government in power in Britain faces the problem of reconversion from a Tory administered war economy to a nationalized social economy, a transition new in British political and social history. The Labor Government of Britain faces the future with approximately a \$16 billion debt to foreign countries, the Sterling Bloc and the overseas Dominions. Britain is financially bankrupt; her resources are depleted and inadequate to meet the technological demands necessary to raise the standard of living of 47 million British subjects under a Price System. The socialism of Clement

Attlee and the 'revolution by consent' of Harold Laski are but the philosophic arrogance of a defunct political ideology in the face of technological obsolescence. No change of legal title, no expropriation of ownership, and no process of nationalization can automatically produce a change in the mechanics of area operation. A

technological redesign of area operation axiomatically carries with it an abrogation of all previous titles, of all previous political legislation, and of all ownership private and corporate. Britain has no choice—the technological factors of the British Isles have already made the decision.

CHQ, Technocracy Inc., Sept. 1

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★ COTTON IS CALLED the universal fibre because of its many uses in industry and households. It is a vegetable product obtained from the pod of the cotton plant. It has been known from remote times, as is shown by the writings of early historians. Columbus found cotton growing in the West Indies and the native making cotton cloth. Cortez, on invading Montezuma's kingdom in Mexico, found the natives weaving beautiful and richly coloured cotton fabrics. Canada has a highly developed cotton textile industry, including both spinners and weavers, and a very wide range of fabrics and goods are produced. In 1943, the industry gave employment to 27,000 persons and had a gross value of production amounting to \$150,000,000.

—DOMINION BUREAU OF STATISTICS

★ DOWN IN THE WARM, shallow waters of the Delaware and Chesapeake Bay on the Atlantic coast, several companies are growing 5-year-old-size oysters in half the time. The speed-up starts with 2-year-old oysters, brought from northern waters. These are placed in trays, which are bare at low tide and covered at high tide. The combination of sun, warm water, an abundance of food, and an absence of mud and sand, works the miracle. Six months after being installed in their new home, they are 5 years old in size and ready to be eaten.

—AMERICAN CAN COMPANY ADVERTISEMENTS

★ DURING THE WAR Canada has become highly industrialized. There are nearly a million more people in non-agricultural industries than there were before Hitler hurled his troops across Poland. We have learned new skills. Many products formerly imported from the United Kingdom can be produced and sold in Canada for less than they can now be imported.

—CANADIAN AFFAIRS

★ THE LAG between technological capacity and social organization is an old story, but the dimensions of that lag have nowhere and never before been so great as in the United States of 1945.

—I. F. STONE in *The Nation*

★ THE MECHANICAL COTTON PICKER has no industrial competitors; it will be fought by small planters and by the workers it displaces, but it will be a future thing because of the incomparably greater efficiency of the machine.

—JOSEPH MINDEL in *Tomorrow*



# The Passing of Politics

*Economic breakdown, caused by the sheer incapacity of present methods to cope with the situation, will prod the politicians and the financiers, together with their outmoded processes of political peristalsis and financial finagling, into a decision to retire to the back benches.*

TWICE in this generation we have been plunged into war. The cunning connivance of reactionary politicians, predatory businessmen, and vascillating ecclesiastics has paid off in heaps of rubble, millions of dead, and a half-dazed multitude of muddled humanity.

For an entire decade intervening, North Americans experienced economic depression at a time when technology stood ready and able to provide an abundance to all citizens. Again, when we finally marched against the forces of fascism, it was the scientist who created the weapons which gave us victory—the atomic bomb despatched the inhabitants of two Japanese cities to the limbo of Shinto glory and the peace dove flew back on the atmospheric surge.

Today we are faced with the task of operating a peacetime economy employing a new array of machines and techniques, yet we find ourselves in the swamp

of political peril. The scientists, technologists, and engineers are the key group in present society. Their importance and influence are of imposing significance. To modern civilized man, science has become the court of last resort. People in increasing numbers are asking: 'What is the scientist's role in the solution of our social problems? Why do the scientists not enter the field of politics? Can a scientist also be a politician?'

A perspective from which to view this subject can be gained by brief examination of the historical record.

The politician employs a certain set of folkways in his methods of social operation. Back to Ancient Egypt, Greece, and Rome he dates his parliamentary procedure. The concept of monetary evaluation had its origin in the crude barter arrangements of early man. We can find the counterpart of our present judiciary in the folklore of the feudal

court. From the Middle Ages and the Renaissance of Europe still survive many behavior patterns that were common to centuries of hand tools and human toil.

Throughout the same centuries science has been in a state of flux. Underlying science's record of continuous change there has been one constant—the methodology of science—which has been defined by Technocracy as 'the methodology of the determination of the most probable.' Or, as H. G. Wells aptly put it, science is 'only a working diagram of facts.' Science operates through systematic research, exact measurement, and objective analysis.

Let us compare political practices with scientific methods and scrutinize political concepts on the basis of the facts as they exist.

In North America today people are encouraged variously to attach themselves to such political parties as the Liberals, the Progressive-Conservatives, the Democrats, the Republicans, the Co-operative Commonwealth Federation, Social Credit, the Bloc Populaire, etc. Each group holds the assumption that a prerequisite factor in the solution of social problems is a widespread change

in the human mind. Their insistence takes the line that people shall think more liberally or conservatively; that they shall have a more international outlook or a more isolationist viewpoint; that they shall support the individual against the state or the state against the individual.

As each election time approaches, scientific objectivity is the first casualty in the contest of emotional oratory. It has been said that a politician is a man who will stand for anything the public will fall for. 'The result is,' as Phillipe Mairat says, 'the disintegration of a people full of saviors who are not on speaking terms.'

Then there is the onlooker who seeks to mediate between the pressure groups which this confusion builds up. Recently the Montreal Council on Christian Social Order issued a statement which included as a major proposal 'the full partnership of labor with capital in industrial management, economic planning, and governmental relations.' This is fine sentiment, but how can you get a dog to stand still when the lice are devouring him and will the lice remain robust if the dog succumbs? The whole arrange-



ment of opposing forces is incongruous.

Can you possibly conceive of such procedures being used in a research laboratory or engineering office? When a scientist dabbles in politics he certainly ceases to be a scientist, at least in that respect of his behavior. To maintain his scientific status he is forced to remain utterly indifferent to politics.

When we consider other aspects of the political approach we find the generally-held contention that the public moulds and directs its own destiny through the vehicle of democratic governance, that the majority has only to vote for a desired change and it will be effected forthwith. Any qualified psychologist will recognize this as a biological absurdity, and any politician who cares to be frank can enumerate a dozen ways in which these ballot-box wishes can be flouted.

In the first place, the mass mind does not mould its own views. These views are often inculcated by the minority only to be reflected by the majority who are made to think that they themselves are the source. An extreme example is the fact that the fascists in Europe and Asia were

able to drag hundreds of millions of people into the abyss of war through methods of indoctrination.

Secondly, social changes are always subject to the limitations of immutable physical laws. Even the politician finds it useless to legislate against the forces of nature. King Canute tried it and failed.

Finally, let us examine the operations of the institution which carries the label 'representative democracy.' Candidates are rarely chosen by the majority. All those who do not vote for the candidate who gets elected are, in effect, not represented, or at any rate they are not represented in respect to any of the issues on which the election has been fought. On the other hand, no representative can, even with the best intentions, represent any one of his constituents on all questions, let alone all constituents on all questions. Besides, the issues which come before Parliament are rarely the same as those on which the M.P. was elected.

It becomes obvious under this scrutiny that regardless of whether our views have intellectual merit, are compatible with physical law, or are motivated by the

loftiest idealism we may still be without representation.

Science cannot possibly associate itself with this type of operation. Science in the social field (Technocracy) insists upon direct contact with, and perpetual inventory of, the social requirements of the human being.

Thus, if science began to treat of social management **politically**, it would find itself surrounded with the amazing assortment of assumptions which existing theories of government propose; assumptions prompted largely by innate desires and emotional considerations, with little regard to physical laws or systematic analysis.

But science need not treat of social management **politically**, as we shall see later. At this juncture we might consider the words of Professor J. B. S. Haldane as opportune: 'Science can do something far bigger for the human mind than the substitution of one set of beliefs for another, or the inculcation of scepticism regarding accepted opinions. It can gradually spread among humanity as a whole the point of view that prevails among research workers, and has enabled a few thousand men and a few dozen women to

create the science on which modern civilization rests.'

Another major device of political administration—the method of monetary accounting—further reveals the inadequacy of the present political approach to social phenomena.

The politician, the businessman, and the financier think of production in terms of pecuniary evaluation. They operate in a world of bonds, mortgages, loan credits, equities, salaries, savings, changing interest rates, and fluctuating prices. They attempt to explain the present and plan for the future with the same folkways as were used in negotiating the trade of centuries ago—when the horse-drawn caravans followed the Mediterranean shore line with their caddies and casks of spices, oils, jewels, and tapestries, making necessary the establishment of the Lombard Banks. They think in terms of commerce rather than of industry; of the **quid pro quo** rather than of distribution.

On the other hand, the scientist, technologist, and engineer think and plan in terms of quantitative mensuration. Their measurements do not fluctuate wildly at

*(Continued on Page Thirty-Five)*



OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN

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## *Blood, Sweat and Profits*

A SURVEY of official treasury figures shows that American business piled up as much profits during the six-year war period as it would have made in 14 years at the prewar level of profits.

Before the war U.S. corporations were averaging profits of little more than \$3,000,000,000 a year, after taxes. The average for the four years 1936-39, which Congress fixed as the prewar level of profits, was \$3,323,000,000.

As soon as the war broke out in 1939, profits began to zoom. (See chart on page 21.)

For the period from 1941-45, inclusive, total corporation profits after taxes have averaged 250% of the prewar level. Since Pearl Harbor they have averaged \$9,000,000,000 a year, or almost 300% of prewar levels.

The total corporation profits since 1939 is about \$47,500,000,000 and the total since Pearl Harbor is approximately \$35,500,000,000.

These figures underestimate war profits because they include a great many small corporations which were losers, and all corporations which were inactive because of the war. A better indication of the profits of the money makers is provided by the statistics for profit-

able corporations alone, which prior to the war averaged profits after taxes of \$5,500,000,000 a year:

Year	Profits
1940 .....	\$7,000,000,000
1941 .....	9,000,000,000
1942 .....	10,000,000,000
1943 .....	11,000,000,000
1944 .....	10,000,000,000
1945 .....	9,000,000,000

This makes a total profit for the profitable corporations alone during the war period of \$56,000,000,000. Many of these companies were losing money before the war, and these figures do not include the companies which made money before the war but lost during the war. The profitable corporations alone have piled up an accumulation of \$31,000,000,000 in undistributed profits and reserves during the war.

Substantiation of these huge profits is provided by a recent report from the Securities and Exchange Commission showing that from the end of 1939 to the end of 1944, the working capital of all corporations increased \$21,000,000,000 or 85%. Most of this was accumulated during the three years following Pearl Harbor. The SEC stated that in addition, the corporations had paid off \$1,000,000,000 of long-term debts, accumulated postwar refunds of \$2,000,000,000, and might get much bigger tax refunds after the war.

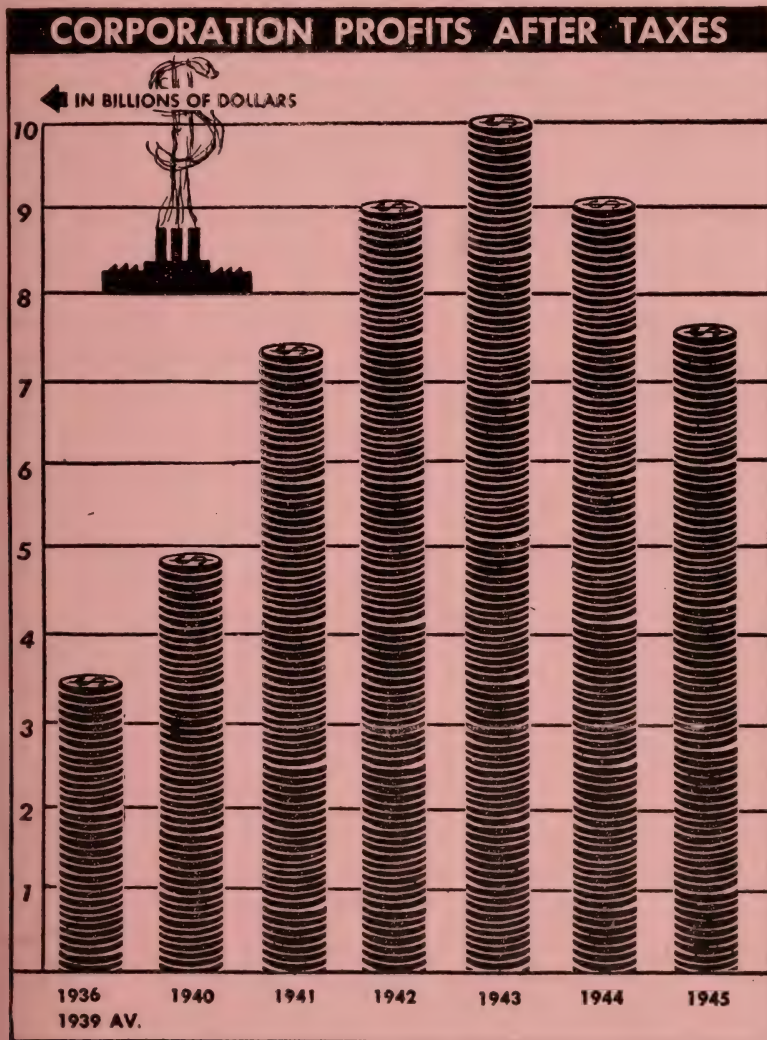
Striking as these profit figures are, they are probably far short of the full story of war profiteering that will only come out years hence. In World War I American shipbuilders' profits estimated at 10% turned out to be 25%, and it was years before the people of the U. S. got the full story.

During World War I the number of persons reporting taxable incomes of \$30,000 to \$40,000 jumped from 6000 to 15,400; and those reporting incomes between \$50,000 and \$100,000 rose from 5000 to 13,000. By the end of the war it was estimated that there were more than 42,000 millionaires in the country.

By the time the full story of World War II is told the figures may be almost as shocking. Comparable salary statistics are not yet



available, but in addition to the corporation profits reported by the treasury, corporations have gained about \$4,000,000,000 worth of new



plants paid for by the Government and have unestimated billions of dollars coming back to them in refunds from war taxes.

Last year corporations made a total of \$25,000,000,000 before taxes and it was primarily the excess profits taxes that cut their gains back to \$9,000,000,000. This year it is estimated that they will make \$20,645,000,000. If the excess profits tax is lifted, without substantial lowering of prices or raising of wages, profits after taxes can be expected to shoot far higher than even during the best of the war years.

Because the citizens of this Continent failed to install Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None, business made billions of dollars of profits on their blood and sweat.

## *Automatic Wood Prefabrication*

**A**N automatic process which eliminates the normal dimensional limitations of lumber in the prefabrication of almost everything made of wood—from ironing boards to houses—is announced by Muskegon Machine Company, Inc., Newburgh, N.Y., producers since 1900 of special wood-working equipment.

In detail, unusual as this may seem, the process employs no unknown principles. Rather, it is through the combination of various known principles, applied to automatic mass-prefabrication, that the process opens up new possibilities for the economical mass-production of all kinds of articles from wood. With the process, panels ranging from  $\frac{1}{2}$  to 3 inches thick, from 10 inches to 16 feet in length, and of practically any width desired can be made 'in one piece,' automatically, on a single machine, using only three men per machine—two to feed untrimmed lumber of any size into the two ends of the machine, one to remove the jointed assembly from the center.

The machine used in the process is an evolution of the well known 'Linderman' machine, used for over a quarter century to eliminate waste in the lumber industry. Prime characteristic of this machine is that it 'welds' wood together in such a manner that a wide piece made from two narrow pieces is at least as strong and frequently



stronger than would be a single piece of the same width. This is accomplished by use of a double-tapered dovetail joint with one or more dovetails for the pieces, supplemented by an automatic gluing process. It locks the wood sections together so solidly that glue, normally, in many cases would not be required. The use of glue is to 'fuse' the wood together, the glue being forced into the cells of the wood at the joint to form a 'welded' bond even stronger than solid wood.

In using the new Linderman automatic fabricating process to produce solid panels for such items as bookcases, ironing boards, table and desk tops, doors of all types, house construction accessories, caskets and boxes of all kinds, etc., square edged lumber or even lumber with the bark still on the edges may be employed. In connection with the latter a special bark edging attachment is made part of the machine to edge the stock automatically prior to the jointing operation.

In operation two pieces of lumber are fed in from opposite ends of the machine. When using sound square edged lumber which might be irregular on the edges up to one-half inch in depth of curve or irregularity, 'Selectrion' fingers will pre-set the feed mechanism so that the cutters remove just the right amount of stock and no more. When straight-edged lumber is used, especially in short lengths, an adjustable feeding fence is used. As the lumber moves into the machine, cutters trim the board and cut tapered dovetail tongues and grooves in the edges. Boards moving in from one end are tongued. Boards from the other end are grooved. As the boards approach the center of the machine, the grooves and tongues are automatically covered with glue, using conical rollers (excess glue removed with stationary 'wipers' and returned to the reservoir). As the boards near the center of the machine, the tongue slides into the groove. At first the fit—due to the double taper of the dovetail—quite loose. As the movement continues, the fit becomes tighter and tighter, until the two boards are locked solidly together.

If the finished panel is to be wider, the jointed boards are returned to one end of the machine, where they are again fed in to meet a single board coming from the opposite end. The panel then is three boards wide. This is repeated until the desired width is obtained.

Finally the assembled panel is passed on to the Linderman chain feed sizing saw and ripped to the desired width. The edging is passed back into the machine for use in the next panel, making the operation continuous.

Lumber as thin as  $\frac{1}{2}$  inch may be joined with a single dovetail. On heavier thicknesses, one or more dovetails may be used, depending on the requirements of the product. Numerous cutter models for different styles of dovetail joints can be furnished or special cutters can be designed to meet any specification. In manufacturing wide lumber which is to be resawed later to thinner sections,  $\frac{5}{16}$  inch thick and up, it is possible to locate and use such styles of dovetail joints that one or more dovetails will be left in each piece after resawing to the desired thickness.

In addition, the process is not limited to fabricating panels by edge assembling. Lumber may also be assembled by running the stock on edge on to a flat piece (for making molding stock). Likewise, lumber may be run across the grain for various uses such as flooring and cutting blocks. Special solid heads with sixteen cutting edges are furnished to meet specifications of this nature.

The machine is not limited to the use of long lengths of lumber it should be mentioned. It is entirely feasible to produce panels say, 10 feet long from short lengths, by assembling the piece endways as well as sideways. It is not necessary to dovetail the end of such boards together to obtain strength. As to inherent strength of the process, U. S. Army specifications recognize a section made up by the Linderman method as identical with a solid piece of the same size.

Three types of feed arrangements are available, depending on the conditions of the lumber to be used by the fabricator.

1. If lumber is of good quality but irregular on the edges—up to  $\frac{1}{2}$  inch in depth of curve or irregularity—the 'Selectrion' feeding device may be used to automatically remove the minimum amount of lumber to straighten and joint the boards.

2. If lower grades of lumber are to be edged for defects and straightened slightly, on the edge, the lumber may be fed against feeding fences equipped with variable dial adjustment, set to remove



the minimum amount of lumber to straighten and joint the edge.

3. Lumber having marked edges and too irregular for the cutters to handle properly, may be fed by means of a bark edging saw attachment prior to the dovetailing operation.

Where the machine and process are to be employed to produce comparatively short runs in a variety of thicknesses, a power raising device is provided for making rapid changeovers from one thickness to another. With this only a few minutes are needed to reset the machine for entirely different thicknesses of lumber or product.

The new Linderman machine employs a multiple V-belt drive from a single motor to the drive mechanism for the endless bed. Motor mounts are adjustable to permit use of any desired motor size. Pulleys are balanced for vibrationless operation and are made so as to be quickly interchangeable when it is desired to change machine speed. A friction clutch is provided in the main drive mechanism.

Automatic lubrication is provided throughout the machine. An ingenious oil-shooting device in the machine bed, sloping on one side and vertical on the other side, insures proper oil distribution while eliminating virtually all chance of clogging. A central force-feed lubricator with visible sight gage pumps oil to eight such slots in the bed, while also lubricating the cutter spindles through added outlets.

The entire system is worked out so that the chain links are always amply lubricated without oil running down the side of the rack. Outlets are so located that maximum lubrication is provided at the points where heat is highest (at the glue reservoir) and where pressure is highest (at the cutter heads).

Glue reservoirs are available either with steam coil inlets for steam-heating or with electrically heated coils.

Cutter spindles are all individually motorized and cutters are quickly interchangeable. Two or four cutters are mounted on each motor drive spindle disc to insure a perfectly smooth cut. A simple special cutter grinder for sharpening cutters is available with the machines, if desired.

Separate spindles are used for roughing and finish-cutting of the dovetail tongues and grooves. The double-taper is produced in

each dovetail by means of an automatic cam action. The bark-edging saws are individually motorized.

Sealed ball bearings are provided throughout, as on the cutter spindles and the bark edging saw spindles and sizing saw spindle. Dust guards are furnished for direct attachment to suction ducts to remove sawdust.

One of the most important details of the machine is the use of five sided driving and tail-sprockets for the endless bed. The design produces remarkably smooth operation and a minimum of side-swing on the slack side of the endless bed. As a result, relatively high chain speeds are possible.

—British Columbia Lumberman

**EDITOR'S NOTE:** *This article does not disclose the number of man-hours of human effort that will be rendered unnecessary by this new production technique, but there can be no doubt after reading the information contained therein that it will displace many thousands of men in the lumber industry and building trades.*

## *Canada's Textile Industry*

**T**EXTILE manufacturing in 1939 employed about 18 out of every 100 Canadian workers in all manufacturing industries. It turned out about \$10 in each \$100 worth of industrial products. The industry occupied 8 out of every 100 factories in the country. It paid \$14 out of every \$100 paid in wages and salaries for all Canadian manufacturing. Of all the capital invested in Canadian manufacturing, nearly 10% was invested in textile plants. The cost-of-living experts believe that nearly \$12 out of every \$100 is spent by the average family on clothing. That puts textiles into the top brackets of Canadian industry. By any standard you choose textiles are in the first half-dozen industries.

Canada's clothing industry has a long history. We used to recall it to tourists (in the days when there were tourists) by showing them highly-prized spinning wheels and weaving looms carefully kept in



the older districts of the country. Some of these instruments date back more than a century and a half. They used to be standard home equipment like smoke-houses and churns and other essentials of a self-sufficient community. But the home manufacturing plant is out now, except in a few districts. Over a hundred years ago it was replaced by the factory with automatic machines to spin fibres into yarn, and power looms to weave yarn into cloth. What had been a handicraft became an industry.

The industry grew and played an increasingly important part in the business life of the country. As Canada approached maturity, our grandfathers became unwilling to see the country remain merely a source of raw materials. The encouragement of the textile industry was one of the measures taken to develop a more varied pattern of production. This meant that we could manufacture finished goods as well as produce raw materials.

Cotton fibres have long been available from the United States and we have developed sources of power, labour, and capital as we have needed them. It was the Civil War in the United States which aided in the development of the cotton industry in Canada because of its interference with the flow of cotton goods. We were able to get the raw material, but we had to process it ourselves. In the years that followed we developed an important industry. By 1943 we had a cotton manufacturing industry in which the gross value of production was about \$15,000,000.

The United States influenced the development of Canada's woollen industry in another way. In this case we had plenty of the raw material we needed but we had exported much of it to the States for manufacturing into cloth. However, in 1866 the United States imposed duties on Canadian wool that made it necessary, as well as desirable, that we develop our own industry to use the wool and supply our own market. A great deal of history is summed up in the fact that by 1942 the gross value of products of the woollen industry totalled \$101,620,000.

The silk industry has developed largely since confederation and its importance has increased with the discovery of methods for producing artificial silk (rayon). These fibres are referred to as syn-

thetic fibres. Between 1924 when the first artificial silk plant was built in Cornwall, Ontario, and 1936, Canadian artificial silk yarn production increased from just over 500,000 yards to nearly 14,000,000 yards annually. In 1935 the natural silk industry production had a gross value of \$466,000 against an artificial silk gross value of \$6,798,000. The former employed 186 workers and the latter 2,169. By 1943 they had a gross value taken together of \$50,440,000.

These three materials are the sources of most of the textiles we make in Canada. There are a great many processes and people involved in changing them from raw fibres into goods ready to take home. It takes about 2,000 factories to accommodate the industry.

The factories aren't so romantic as the early devices appear to us now, but they are more effective. They can do more in a day than our ancestors could do in a month. One operator can handle more than a hundred automatic spindles—the machines that twist and wind the thread. Corresponding efficiency with the looms provides us with most of our cloth in much less time.

Textile manufacturing is really a series of industries—from those that secure the raw materials to those that sew on buttons. The industries begin with three main materials: cotton fibres, woollen fibres and synthetic fibres. With each material the whole process is divided into two parts known as primary and secondary.

The primary stage covers the processes required to transform the animal, vegetable and synthetic fibres (cotton and wool and silk) into threads and from threads into cloth. Towels, blankets, underwear, hosiery, velvets, draperies, upholstery, tire fabrics, canvas and carpets are all regarded as primary textile products, because they leave the loom almost ready to be sold to the user.

In 1941 more than 85,000 Canadians were employed in primary textile processing. They were doing the spinning, weaving, pattern designing, dyeing and knitting required to transform raw materials into various kinds of cloth.

The secondary textile industry uses this cloth for the manufacture of innumerable articles ranging from the cap on your head to the linoleum under your feet. Among other things the industry produces men's suits and women's dresses, hats, caps, haberdashery, corsets,



cotton and jute bags, oiled and waterproof clothing, cordage, rope and twine, awnings, tents and sails, oil-cloth, curtains, window blinds and backing for linoleum.

Just about every second person employed in the textile business works at secondary textiles. Most of their occupations are known as the 'needle' trades. A needle trade shop may employ a designer and a grader, a few cutters, finishers, pressers, shippers and many machine operators. The business details, as distinct from the manufacturing processes, may provide employment for several salesmen, a small office staff and a manager. These are some of the secondary textile jobs. They are carried on in much smaller shops than primary processes. Seventy-two thousand garment workers and related tradespeople do their work in more than 1,400 factories—about 50 employees per factory; while the eighty-five thousand primary workers occupy fewer than 500 mills—170 in each mill.

There's a kaleidoscopic view of the industry. That's what is meant by textiles and, in brief, that's how raw materials get to be useful articles—from cotton plants and sheeps' bodies and silk worms to furnishings for homes and clothes for humans.

—Canadian Affairs, Reconstruction Supplement No. 1

EDITOR'S NOTE: *This brief story of Canadian textiles provides a panoramic view of one of our most important industries. It shows that Canada has definitely changed over from merely a source of raw materials to a great manufacturing nation.*

## *Neoprene and Natural Rubber*

**M**OST basic raw materials for chemical manufacture have been in existence and available in unlimited quantities since time immemorial. This is true of coal, limestone, salt and water, for example, but the one primary material required to catalyze the use of all others is the 'know-how'—the fundamental knowledge. The pro-

duction of synthetic rubber is a direct result of the adaptation of chemical knowledge to the utilization of raw materials. The incentive may be the chemist's inquisitive nature, or his determination to duplicate and improve some of the products of nature, or it may be the desire of a nation to make itself independent of a foreign source of supply of a natural product.

Early investigations of the chemical structure of natural rubber followed patterns laid out by workers in other fields.

Faraday established the chemical constituents of the rubber molecule as having 5 carbons and 8 hydrogens. Greville Williams isolated isoprene by the destructive distillation of crude rubber. Then Bouchardat proved that isoprene treated with hydrochloric acid could be reconverted to a material that had elasticity and other characteristics of rubber. Tilden and some of his contemporaries established the structural formula for the isoprene that resulted from destructive distillation of natural rubber and then synthesized isoprene from other materials. Many other investigators followed similar courses, but it was not until the 1930's that real progress was made. About this time the Du Pont Company and others started an extensive research program on materials that might be used as substitutes for rubber. In 1925, Dr. E. K. Bolton, of Du Pont Company, heard a paper delivered by the late Father Nieuwland of Notre Dame University on his observations of some reactions of acetylene. It was shown how acetylene could be coupled with itself to form a 6-carbon straight chain product that was highly reactive. Such a product with its high degree of unsaturation appeared to be the possible starting point for the synthesis of a wide variety of organic products.

Further studies by Du Pont chemists revealed that under carefully controlled conditions a compound containing 4 carbon atoms could be produced which was quite reactive, and this product, known as monovinyl acetylene, is the basic material from which, ultimately, neoprene was developed. Monovinyl acetylene, after purification, is reacted with hydrochloric acid to form chloroprene and this in turn is polymerized in emulsion form, coagulated, and dried to produce neoprene.

Why are more neoprene plants not being built? The principal



reason is that it takes a tremendous amount of electrical power to make the carbide from which acetylene is generated. Also the finding and training of capable technical and operating personnel was a serious problem. In training men for the Louisville Works, the Deepwater plant was run with two men at every operation, one being required for the job and the other being a student. It is a tribute to the young technical school graduates that they acquired the operating 'know-how' so that when the plant at Louisville was ready, they started operation with little trouble.

Neoprene has been on the market since 1932 and was the only general purpose synthetic rubber produced in the United States before the war. It is the only synthetic rubber that can be used as a replacement for the natural rubber product for virtually the entire range of uses of rubber. Pure gum neoprene products have substantially the same tensile strength, elongation, and elasticity as has natural rubber, and, when loaded with reinforcing fillers such as carbon black, neoprene has abrasion resistance equal to that of natural rubber under all ordinary conditions and is quite superior under conditions that involve exposure to sharp abrasives or extreme heat.

Almost from the first, rubber technologists have known that films deposited from latex are of better quality than sheets made from milled rubber. The latex films aged better, were less readily attacked by solvents and oils, had higher tensile strength, and complicated shapes could be more easily formed by dipping procedures. Previous to 1930 latex was not widely used, mainly because of difficulties in preserving it during shipment from Malayan and East Indian production centers. However, with development of preserving methods involving ammonia and phenolic type bactericides, latex became important in the rubber industry.

Products made from neoprene latex include all types of dipped goods. Neoprene latex has been used for fabric proofing and combining, and is being studied as a treatment for tire cord, while coated fabrics are more flame and chemical resistant than rubber-coated fabrics. Thread made by extrusion of neoprene latex into a coagulating bath possesses good resilience and is highly resistant to perspiration, solvents, and repeated laundering. Foam sponge may be made

in a variety of densities, ranging upward from about 6 lb. per cu. ft. This product is very resistant to oxidation and heat, and possesses oil, flame, and sunlight resistance superior to rubber.

Neoprene will cure without any added agent, in direct contrast to rubber, which explains a great many of neoprene's unusual characteristics. It changes during long storage, the changes becoming more noticeable as the temperature is increased. They are observed first as a very definite drop in plasticity, a softening of the raw polymer with excessive stickiness on mixing equipment. Compounded stock made from aged neoprene is faster-curing, and scorches more readily on processing equipment.

One of the largest possible uses for any elastomer is in the tire industry. Neoprene has several properties that make it desirable for use in tires. At normal temperatures it has much greater fatigue resistance than natural rubber. By fatigue resistance is meant ability to stand up under extreme flexing without failure. Its resistance to weathering is superior to other elastomers. This suggests its use as veneer on all types of tires and particularly tires for agricultural equipment.

Another important use is in resilient mountings, generally thought of as structural members that minimize transmission of vibration and noise. The use of rubber as a resilient mounting was introduced in the early twenties. The principal use and most rapid development took place in the automotive industry. During the next decade, rapid strides were made in the efficient utilization of rubber, and its use was expanded until practically all automotive and aeronautical transportation was rubber cushioned.

Neoprene compositions have demonstrated their ability to adhere to metal and to give satisfactory performance when properly compounded and designed for automotive equipment. Neoprene produces vulcanizates whose physical properties more nearly approach those of natural rubber than does any other synthetic investigated. For a number of years, it has been recognized as an outstanding material because of its resistance to sunlight, ozone, oxidation, oil, heat and abrasion. Its superior resistance to heat and oil will add to the life of the mountings, in automotive equipment and in aircraft, which may



encounter not only heat and oil, but also ozone. The first cars of postwar design will probably contain an increased quantity of elastic parts made from synthetic rubber, principally dynamic balancers and independent suspension of the wheels through rubber members. In the aeronautical field, even greater expansion will take place.

The newest streetcar wheels contain a rubber member sandwiched between the main wheel and the steel tire or rim, thus eliminating noise and vibration and making possible a more efficient and comfortable ride. The expanded use of synthetic rubber parts in postwar trolley cars, railway coaches, and sleeping cars may include replacement of springs with a synthetic rubber member.

Neoprene mountings will also be used in increasing quantities to cushion and protect heavy industrial machinery.

Of many new applications for neoprene, one of the most outstanding is its use in electrical cable. Earlier types of neoprene were occasionally tested electrically in various laboratories. Most of the results fell far short of the remarkable insulating properties of natural rubber compositions. Since then, more recent developments of neoprene, both in types and compounding techniques, have revealed that it can be compounded to give adequate electrical properties. In general, the insulation resistance of neoprene is lower than that of natural rubber. However, they are about equal in dielectric strength. The specific inductive capacity, or dielectric constant, and the power factor of neoprene are higher than for natural rubber. For these reasons it does not make a satisfactory insulation for telephone wire or where high frequencies are involved. Neoprene is satisfactory for low-voltage applications. As an example, it has recently been approved by Underwriters' Laboratories, Inc., for use as a Type RW (moisture resistant) insulation for voltages up to 600. It may be used for insulation where high voltage is involved, if the current is low, or where current is high if voltage is low.

Other places where neoprene insulation has been used are on radio hook-up wire, low-voltage submarine cable, electrical system of the 'B-29' aeroplane, and for military assault wire.

Neoprene, like rubber, may be compounded so as to be a semiconductor, for use where static electricity must be dissipated. After

the war, the chain dragged by trucks transporting gasoline or other highly volatile and flammable solvents may be replaced by use of a conducting neoprene composition for the sidewall and tread of tires. At the present time, tires on the tail wheels of bombers and other large aeroplanes are made of a conducting neoprene composition, to dissipate static electricity as soon as the plane lands.

There are other uses wherein neoprene compounded with conducting blacks disperses static charges. One is in hospitals, where it is used as treads on caster wheels, for heels and soles, and hospital sheeting, to ground static electricity and thus prevent ether explosions. Another is in resilient mountings for industrial equipment and motors that develop static electricity.

When rubber is compounded for insulation, it is necessary to cover the insulation with some material to protect it. The jacket or sheath may be rubber. However, the best rubber jackets have limited serviceability when exposed to ozone, oil, sunlight, or heat. Neoprene, for a number of years, has been recognized as an outstanding jacketing material.

Probably no use of an elastomer is so commonplace as in heels and soles. Shoe trouble had long been a source of annoyance and expense to workmen in garages, gasoline service stations, refineries, dairies, slaughterhouses, chemical plants, and steel mills. Soles and heels made from leather or crude rubber compositions did not stand up in oils and greases, on hot floors, or on floors that were sprinkled with metal cuttings. Neoprene found a ready market here.

The emphasis on all synthetic rubbers for military purposes has had a favourable influence on expansion of many commercial uses. A wide variety of new uses might have developed slowly without war impetus. As time goes on, more uses will become apparent, and a permanent place in our industrial world will be established for a new engineering material.

—E. H. Krismann in *Canadian Chemistry and Process Industries*

*EDITOR'S NOTE: This comparison of the qualities and uses of neoprene and natural rubber reveals that in many cases the synthetic product is superior to the natural. Through application of technology man is able to duplicate and even surpass the materials provided by Mother Nature. The technologist is the logical leader of a technological age.*



(Continued from Page Eighteen)

he whim of the market. They are concerned with physical data instead of what the market will bring. Materials and energy are their tools, and these they are able to commit to exact estimates.

The technologist knows that industry in the Power Age 'operates as a moving mechanism in a sequence of events, the course and rate of which has been arranged and ordered in strict accordance with exact calculation. When he looks at the world he notes that everything that moves, including the human body, does so by an expenditure of energy which may be expressed in terms of calories or joules.'

The technologist is thus able to gauge social change in specific status—by the relation between rates at which man has been able to convert the energy of the physical world to his use. It is this way that the technologist considers 'standard of living.' Instead of floundering in a welter of fluctuating values and market trends, the technologist acts on the principles of energy conversion and the balanced load.

Modern technology does not view production as a 'process that terminates at a point which may

be designated as F.O.B. the plant.' It has to view the matter of production and distribution as a single problem.

This marks the difference between national industry and commercialism. In the words of Homer Lea: 'While industry is the effort of people and their machines to supply the needs of mankind, commercialism utilizes this industry for the gratification of individual avarice.' The larval greed of those who feed on our technological greatness is socially objectionable, but of even greater concern is the complete inability of the 'big operators' to perceive the basic factors which create our present distribution problem.

The general tendency today is to feel that the social labyrinth is so capacious and capricious as to be beyond the sphere of management by science. We admit that science cannot treat of social management **politically**—but scientists can assume leadership in the role of social engineers. At this stage in the economic progression of North America, science and technology can go forward with the blueprints of a social mechanism based on exact mensuration through the technic of the Energy Certificate and the

principle of the balanced load.

Such a social mechanism will discard the ancient folkways of pecuniary practice and parliamentary procedure, and it will preclude the use of the entire array of political and financial clap-trap which has accumulated through many centuries of scarcity and toil.

When can we expect the transition to take place?

When the march of physical events makes the majority of North Americans ready for social change—ready to conform to our Power Age environment and to

submit only to the dictates laid down by the requirements of the job in hand. And when the men in the driver's seat are finally forced to admit their incompetence—when economic breakdown caused by the sheer incapacity of present methods to cope with the situation, prods the politician and the financiers, together with their outmoded processes of political peristalsis and financial finagling, into a decision to retire to the back benches.

'Yesterday belonged to the politicians; tomorrow belongs to the Technocrats.'

—C. Warren Lowe

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★ NEW YORK, Sept. 26—A novel newspaper vending machine that dispenses up to 200 papers and gives change for a five cent piece will have its first public test next week at an as yet unselected station of the independent subway system.

Designed by Samuel Leschin, a milliner and a man with a long history of gadgeteering, the device will be tried out for three weeks by the Interborough New Company, a newspaper dispensing agency.

If it passes the test, Leschin said, he will begin full production of the machine after the first of the year with plans to turn out 40,000 of them in 1946.

Claimed to be virtually foolproof in its method of delivering the paper and returning the change, the machine scrupulously rejects wrong coins, slugs and other foreign materials dropped into its slot. The change, which, depending on the price of the paper, may be one, two or three cents, comes carefully wrapped in a cardboard container and slips down the main chute along with the paper.

—VANCOUVER NEWS-HERALD

★ SOFT DRINKS by the cup are provided by a revolutionary coin-in-the-slot vending machine developed by C. C. Bradley and Son in Syracuse, N. Y. The machine stores soft drink syrup in bulk, carbonates fresh water automatically when a coin is inserted in the mechanism, mixes the two ingredients in correct proportion and delivers the soft drink in a paper cup. The machine will serve 40,000 cups of beverage on one filling.

—CRESTON REVIEW

★ IN THE LAST 25 YEARS, the improvement in equipment, including more powerful locomotives allowing larger trains, has resulted in a decline of railway employment from 2,000,000 to 1,413,000 in 1944.

—CANADIAN BUSINESS



# The St. Lawrence Project

*Now that we are beginning to face mass unemployment in Canada and the United States, the Governments of both countries are starting to look around for public works programs which will create jobs. Technocracy advocates that the St. Lawrence project be placed first on their list.*

FOR almost half a century the proposal to harness the energy of the St. Lawrence and open the entire waterway to deep-draft ocean-going vessels has been before the Congress of the United States. As far back as 1921 both Canada and the United States agreed that it was desirable jointly to develop the international section of the St. Lawrence for power and navigation.

Fifteen years ago this July a treaty to implement the original Joint Commission recommendation of 1921 was signed by the two countries at Washington. Canada passed the treaty but it failed to get through the U. S. Senate. Canada, therefore, stands committed to complete the project at any time the United States is ready.

Down the years the project has been opposed by potent vested interests: railway and private power blocs; canal and port authorities at Erie, Buffalo, Chicago,

and other points where established commerce would be affected; Montreal Board of Trade and Quebec interests.

The project has been advocated by such influential Americans as Calvin Coolidge, Alfred E. Smith, Herbert Hoover, Owen D. Young, Henry I. Harriman. The late President Roosevelt made repeated attempts to have the proposal adopted. Each time he was stymied. Therefore, the news that President Truman is going to ask the U. S. Congress to approve the St. Lawrence Seaway has aroused little Canadian enthusiasm. Until the necessary two-thirds majority in the U. S. Senate is forthcoming, Canadians take a dim view even of presidential approvals.

Meanwhile, as Benjamin J. Atlas has said in the **New Republic**, 'Far to the north of where the familiar arguments will be heard the St. Lawrence spills its way to the Atlantic in the manner of

some Gulliver proving his strength while the Lilliputians still conjecture his worth.'

Engineers of the United States and Canada have completed surveys showing that for \$421,000,000 the last remaining obstructions to deep-draft navigation could be removed and a power plant built to give the people of the Northeast a hydroelectric development far bigger than the TVA. In annual output of electricity the project would be the greatest in the world.

Three hundred million dollars have already been spent to improve the navigation alone on the 2,687-mile Great Lakes-St. Lawrence artery from the heart of North America to the open sea. At present only a 115-mile stretch remains to be completed to enable vessels of 22-foot draft to reach the head of the lakes. In addition to providing the key for use of the waterway by deeper draft boats (the present draft in the international section is only 14 feet) there is at least two million low-cost horsepower awaiting development in the international section.

The navigation part of the project as at present proposed by North American politicians would

block passage to 10% of the world's ocean shipping. Technocracy has its own specification for a St. Lawrence waterway that would allow all the modern deep draft vessels on the high seas to ascend to the head of the Great Lakes. The St. Lawrence division of Technocracy's Continental Hydrology calls for a seaway 'from the St. Lawrence River to Lake Ontario, and for all river and locks on the Great Lakes to have a clearance depth over sills of 11 meters, and a minimum channel width of 200 metres; for twin double hydraulic lift locks to be installed on the St. Lawrence to raise all necessary shipping to the level of Lake Ontario for similar twin double hydraulic lift locks to be installed between Lake Erie and Lake Ontario.'

The waterpower part of the project would supply an urgent need for low-cost electricity in an area inhabited by one-fifth of the Continent's population. Vice Chairman Leland Olds of the U.S. Federal Power Commission (former member of the Technic Alliance, which was the forerunner to Technocracy) recently pointed out that the monthly electric bill paid by New York City householders for 100 kil-



watt-hours would buy 250 kilowatt-hours in Cincinnati, Madison, Topeka, Spokane and Washington, D.C.

The probable effect of plenty of cheap power in the Northeast can be determined by a survey of the part played in Southeastern United States by the Tennessee Valley Authority. The use of electricity in the Valley is twice the national average. In a city like Chattanooga, the use of household appliances is seven times the national average. Abundant electricity at low rates (the average householder pays less than two cents per kilowatt-hour) has resulted in relieving the burden of household drudgery in half a million homes. Among Valley housewives not only are electric radios, vacuum cleaners, toasters, irons, fans, and heaters commonplace, but such items as electric stoves, dishwashers, and washing machines.

Electric power from the TVA is used freely by farmers. A great deal of backbreaking toil is now being done by tireless slaves—pumping water, grinding feed, shelling corn, separating cream, sawing wood.

More than half of all the aluminum produced in the United

States is processed in the Tennessee Valley. In addition, there are planes, ships, fibers for tires, shoes, rayon, oxygen, hydrogen, ferro-alloys, methyl alcohol, and numerous other commodities. It was the vast quantity of TVA power that was largely responsible for locating one of the two chief atomic-bomb plants in the Valley.

Now that we are beginning to face mass unemployment in Canada and the United States, the Governments of both countries are starting to look around for public works programs which will create jobs. Technocracy advocates that the St. Lawrence project be placed first on their list. Even the political abortion as at present proposed by the politicians of North America has estimated make-work possibilities of 20,000 jobs for four years. If carried out to Technocracy's specifications as part of the Continental Hydrology (see 'A Concept for a Continent,' **Technocracy Digest**, February 1945), the project can provide employment to many thousands more. And it will make a mighty contribution toward a New America of abundance and leisure for all.

—Donald Bruce

# Technology Smashes the Price System

*A new system based upon a recognition and an understanding of our available energy must be devised. That is the problem before the people. It can be done. Are we going to set about it before it is too late?*

(CONTINUED FROM LAST MONTH)

NOW let us turn from the question of employment to the question of money. Under our present Price System we manufacture goods not to use but to sell—and make a profit; and profit as we have previously seen is a debt claim. When the great period of American industrial expansion began we had a huge frontier, the West was undeveloped, we could make use of a great increase in population. The opportunity for this expansion was so great that for a period of years we could make any number of mistakes and still escape

the consequences. Then, little by little, a horror began to appear. So swift was the advance of technology that machines and plants began to go out of date before ever we had got to a point where the debt incurred to buy them might be paid. The first Curtis turbine built by General Electric for the Insull interests in Chicago in about 1903 was withdrawn in September 1909 in perfect working order and now stands in the General Electric yards as a relic of a bygone age. That obsolete turbine is still being paid for in interest on the bonds sold to buy it. Since obsolescence retired equipment before it could be paid for, there was nothing for it but to borrow again and issue more bonds and mortgages and start paying interest on that along with the interest on our first borrowings. So higher and higher rose the country's mountain of debt. To make a profit we borrowed to pay what we borrowed with

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*This article, prepared under the supervision of Howard Scott and published by HARPER'S MAGAZINE in January 1933, is one of Technocracy's basic statements. The use of atomic energy and the present Price System crisis (which followed the withdrawal of World War II's artificial stimulation) have sharpened its significance. The editors of TECHNOCRACY DIGEST reprint this material now with the knowledge that the social analysis presented therein has stood the test of time better than that of any other organization in North America.*



borrowed more, to make a profit in order to pay off what we had borrowed twice, we then borrowed all over again.

A careful examination of the debt figures and the production figures of this country—and these figures have been repeatedly checked and cannot be brushed aside—reveals the appalling fact that for years our debts have been increasing at a rate faster than production and both of them faster than the rate of population!

The industrial debt of this country—bonds, mortgages, bank loans, and all other interest-bearing amortized securities—totals approximately 218 billions of dollars. The fixed charges on this debt are equal to over half the present national income.

One of our great American railroad systems has paid for its equipment and construction by borrowings which, according to its annual report issued December 31, 1931, total about 310 million dollars. Of this sum something over 3 millions is supposed to be paid by 1948. Another million is due in 1968. By 1997 over one hundred and six million will come due; the rest of the debt is postponed to the year of grace 2047, when one hundred and nine-

ty millions must be discovered somewhere to pay for the comfort and convenience of a time as remote from the ultimate debtors as we are from the Presidency of James Monroe when railroads did not even exist. And where are they going to find this money? Where indeed? To look at these figures and then think of the outcries against Bryan's supposed inflation is enough to cause suffocation from laughter. Is it clear that those bonds are to pay for locomotives that will long since have rusted away, equipment long since worn out and discarded, pay perhaps for a railroad that may not even exist?

This condition can be found today in scores of industries, and pages might be devoted to examples. It is useless to labor the point. The important thing is that the condition has been brought about under the system which we at present use—the Price System. It is a very old system and has been in use about as long as we have had written history. It was built for a world in which man did the labor, and its excuse is that barter is too clumsy and that for the sake of convenience we shall exchange all our goods in units of one

commodity—in our case gold—and the number of units agreed upon in this exchange is called the price. Modern industry is operated under the Price System and to be successful it must do one thing: it must make a profit and pay a return on the money invested. Forgetting all other considerations for a moment, the amount of profit depends on the quantity of goods than can be sold. That is the reason for the incessant cry for trade expansion abroad and at home. On the other hand, inside his plant the producer has found that his profit increases if he cuts the cost of production, and that the surest way to do this is by producing on a large scale by means as automatic as possible—in other words, with machines. A producer does not install machines in order to give his employees more leisure; he uses machines because they multiply many times over the output of which his employees were capable and at a faster and much cheaper rate. It is only lately that people have observed that the producer is putting out a most sinister and profitless product—unemployment.

We have spoken of the return that the producer must make to

the investor in interest and dividends. It happens that industrial investment is made for the most part by a very small fraction of our population, and the return on that investment must be put somewhere. It has been argued that this interest and dividend return goes into circulation again but this is exactly what does not happen. The small investing fraction of our population cannot possibly spend all their interest and dividends, and the result is that this return must be reinvested in production. There is nothing else to do with it.

Consider, for example, the Ford Motor Company which is the sole property of Mr. and Mrs. Ford and their son Edsel. In 1930 the company had outstanding 172,64 shares of stock owned by these three persons, which yielded a profit of \$237 a share. Allowin for all the spinning wheels, antique furniture, and Wayside Inn in the world, how much can these three persons spend of a single year's profits of over 44 million dollars? Obviously not very much. The one thing possible is re-investment in production. This means that production must pay further interest and dividends. Year after year this re-investment i



stocks and bonds (which of course are more shares in the debt owed by production) has demanded more and more interest on production. In order to keep up with this mad business, production has to increase at a compound interest rate in order to pay for the river of money being invested in it. This of course is impossible and the result has been —this is not guesswork but a statement proven by bleak and cold figures available to anybody —that debt has increased faster than production. The only way to **maintain** this debt (for neither the bankers nor anyone else ever expects it to be **paid**) is with continuously increasing sales of goods; and when the debt increases faster than we have made the goods, which is exactly what has happened, we steadily approach a point where the whole concern goes to pieces. To pay our debts we have to borrow on our goods faster than we can make them. And all the while the rate of the debt increase is greater than the population increase, so that each year we owe more than we did before, and next year we must owe more than we do today.

Suppose that production were

levelled off to a point where we produced just enough for our requirements. Then, under a price and profit system, the producer must cut his costs to a minimum in order to wring the last profit possible out of his business. The only way which presents itself is through the machine, and the result is more unemployment. If an attempt is made to keep all the people employed the increasing output results in a catastrophic overproduction. And should we hold production down to what we actually need, the lack of new industries or expanded old ones in which to invest profit would make money so plentiful that the interest rate would be driven toward zero. A recent ninety-day loan was made in New York at one half of one per cent! Can there be imagined a more pathetic spectacle than the bank book which shows no interest entry or the banker who disconsolately walks through a vault filled with currency with which he can do nothing?

For the sake of profit, miracles have been done with the machine and with organization. We have been able to produce more and more food, make available more and more raw material with less

and less labor. Although this has meant larger immediate profits for the producer, it has proved in the long run that fewer people were employed and so had less money to pay for these goods. While this was going on, as we have shown, profit has again been put back into more and more highly geared and concentrated production, turning out an ever increasing stream of goods in exchange for which there are steadily less wages and salaries. There is a contention that labor which is thrown out of work by the machine in one industry is able to find employment in another. But figures covering a long period of years prove beyond contradiction that this is not the case. The high-water mark of industrial employment in America was reached in 1918 and ever since that time, through all the great years of the boom, it has been steadily falling. As industry becomes more and more mechanized one door after another is shut to human labor. And all the while the Midas profit is put to producing more goods. In the end one sees the producers, fewer and fewer in number, engulfed in goods which they can neither sell or use, bowed down

with interest and dividend debts which they cannot pay. Besides them is the little concentrated band of owners, swamped in money for which there is no use. Opposed to them is a vast army of laborers, white-collars, professionals, and all with neither food nor clothing nor the money to pay for them. Spread out before all three groups is the spectacle of a gutted Continent, its resources wasted and flung away in the crazy race for the profit that strangled the system.

Why is it that with all the available sources of energy in America the Price System will not work? The reason is that the Price System demands that the price of labor be high enough to buy the goods produced. The use of technology in industry sets three things in conflict with the system itself:

1. The mechanics of placing purchasing power in the hands of the consumer is the exchange of money for the consumer's time (or labor), and technology is reducing the total amount of time required.

2. The working of the Price System has forced the manufacturer to reduce the total number employed rather than to distribute the amount of time required among the total number of available workers. Technology has now advanced



... a point where it has substituted energy for man-hours on an equal basis and where the distribution of human labor becomes impossible.

3. Through increased investment in machines—made necessary by the increasing rate at which they go out of date—the manufacturer is forced to reduce the proportion of his costs which go to labor. This again inexorably works against the increase of wages and the distribution of time.

In other words, a Price System demands man-power if it is to succeed, and man-power for production steadily becomes more and more a thing of the past as the kilowatt hour takes its place.

On a population basis this country has a capacity of 3,600,000 horsepower. But the country is not run on such a basis. Technology has stepped this capacity up to a billion horsepower, and it is this tremendous power let loose which is battering the Price System to pieces. Yet we cannot voluntarily cease the use of this energy for we have now gone so far that our very lives depend upon it. As we have said before, 7% of the available energy is used in the provision of food. The other 93% goes to keep our society going. A close calculation estimates that if we shut off our coal, oil, electric and water power

a large percentage of us would be dead in 20 days or thereabouts. So highly integrated a mechanism has our country become with its very life dependent upon the smooth and continuous operation of our electricity, steam, and water power, our coal, oil, and gas that the blunderings of an Insull, the clumsy smashings of bankers are little short of murderous. A chemist in the laboratory of an oil company can examine the sample of a certain grade of gasoline and tell you in figures that will never change exactly the maximum number of heat units that can ever be extracted from that grade. He can measure exactly, and that exact measurement is absolutely necessary in running our system. But can the sales manager in the office next to the laboratory tell you the exact price of gas next month, next year, or ten years hence? It is absolutely impossible; we are playing with dynamite when we attempt to harness the system to price.

The truth of the matter is that the United States has become a huge and intricate machine, and to operate the machine with any degree of success demands a control that has some relation to the

machine itself, not to a system of economy which is not susceptible to exact measurement. The persons who at present control this great mechanism are persons whose rules of conduct originated in the days when man was the sole engine—in other words, the persons to whom debt is owed—bankers, merchants, industrialists—creditors of every sort, possessors of debt claims against the physical operations of this system. Under a Price System, debt is the controller, and the bankers are those to whom society has given charge of debt. So we have before us the spectacle of a company of persons attempting to run a social system under rules which actually were cancelled on the day when Parliament confirmed James Watt in his patent on the steam engine. In the pursuit of profit they have raised debt to the incredible heights that we have already described. The gigantic stretches of credit necessary to build and expand call for almost more money than imagination can compass. How clearly can it now be seen that our bankers are merchants of debt and economics is the pathology of debt!

Almost forty years ago an

Englishman named MacLeod, one of the great apologists for the Price System, was candid enough to admit: 'At the present time Credit is the most gigantic species of property in this country and the trade in Debts is beyond all comparison the most colossal branch of commerce. The merchants who trade in Debt—namely Bankers—are now the Ruler and Regulators of Commerce they almost control the fortune of States. As there are shops for dealing in bread, in furniture in clothes, and every other species of property, so there are shops—some of the most palatial structures of modern times—for the express purpose of dealing in Debts, and those shops are called banks.'

Like a boa constrictor, the debts that the bankers have been forced to create are now engaged in crushing the life out of the Price System. For several months the country has been witnessing the impossible spectacle of the Reconstruction Finance Corporation attempting, through taxation to shore up these debts and make them payable at par!

The supreme fault of the banker is not that his aims are sordid or that his appetite is rapacious



he trouble is that he is hopeless-  
out of date. He could oper-  
te a system dependent upon man  
power, but our adoption of tech-  
nology has rendered him hope-  
lessly ineffectual. There is no-  
thing in any system of economics  
of banking or accounting that  
will assist him in maintaining the  
rate of energy flow which is the  
life blood of this country. He  
knows absolutely nothing about  
and when he attempts to regu-  
late it on a basis of gold supply  
or demand notes, is it any wonder  
that he all but wrecks it? Price  
is not a measure at all; it is a  
unit of value. The only possible  
way he can measure a pair of  
shoes is by calculating their price  
in a kilowatt hour that he can  
extract from the consumer. What  
is that price to do with the exact  
measurement of that electric  
current? Nothing. Much has  
been written about the powers  
of superstitions and how great  
their influence has been. In a  
day when man is the sole engine  
for work, a social system can-  
not get along somehow with super-  
stitions and not go under; but  
any system of society whose life  
depends on a steady distribution  
of its energy resources—and our  
society at present is so dependent

—is risking destruction by a be-  
lief in superstition. Would we  
tolerate as rulers a collection of  
medicine men from the Congo  
who attempted to run our system  
by the use of charms and by the  
beating of tom-toms? That is ex-  
actly what we have been doing  
and what we are doing now. The  
bankers in this technological day  
and age are medicine men and  
nothing else. Nothing has so  
completely exposed the banker  
and his industrialist subaltern as  
their own utterances since this  
latest and most paralyzing of  
slumps began.

The nation has strained itself  
almost to the breaking point to  
maintain the Price System. Such  
a system cannot much longer en-  
dure. Under present conditions  
it will be impossible for us to  
procrastinate for another decade,  
putting off the hour of decision  
and action\*. Whether it be pos-

---

\*Only the artificial stimulation of World War II made it possible for the Price System to survive until now. The absorption of our manpower into war industries and the Armed Forces put purchasing power into the hands of millions who had previously been unemployed, and the rapacious appetite of war created the condition of scarcity so necessary to Price System existence. With the war at an end we face the same problems as are outlined in this article—but in even more violent form.

sible for the system to make a terrific effort, inflate itself and shoot up on one last sky rocket boom before it falls into the abyss makes no difference. The crisis is imminent and must be met. A cold analysis of existing data makes clear that if we allow ourselves to drift for another two years in the way we have been doing for the past three, we shall have some twenty million unemployed. If we think of the complexities of holding our debt structure together for many months at the present rates of business activity, the problem becomes appalling.

What are we going to do about it? It has been our great misfortune that in our disaster the only people that we have had to look for guidance—now that distrust of the banking fraternity has become so widespread—have been the economists. These have ranged all the way from such stock market necromancers as Irving Fisher to the emotional popular economists, Marxians, and all are as archaic as the bankers, for they are tied hand and foot to a conception of price. What does price mean in a country where 0.44 of a single pound of coal can do the work that the

average man can do in eight hours? It matters not a rap what men think, wish, or desire. We are face to face with a law of nature. The law of Conservation of Energy has a perfectly definite social implication. It is plain that we must get for ourselves a new series of standards if we are to deal with this highly intricate social mechanism that technology has built.

What is wealth, real wealth? The economists vary in their definitions, but in general the word is applied to all subjects possessing value. Marshall, the famous British economist, defined value as the measure of desire. So a pig that is owned is wealth because it can be sold and hence is desirable. But a pig on a mountainside is not wealth and cannot be until someone establishes a claim of ownership. But as we have pointed out, under the Price System wealth becomes the ownership of debt, and the more you use of debt the more you have.

We have heard a good deal in the past year or two about underconsumption, but it has occurred to but few people that it is not what a people produce that provides their wealth, it is what they con-



me. Wealth is the conversion of available energy into use forms, be it potatoes, shoes, or electric light. The process of being wealthy consists in using up—without wasting—the products which, through the use of energy, we are able to make. The United States is the most nearly self-sufficient geographical and industrial unit on the face of the earth. We have 60% of the coal reserves of the world and 40% of the iron ore. We produce and consume more than 69% of the world's oil. We are the greatest producer and consumer of natural gas—85% of the world's total. We occupy 400,000 square miles of land area—have 6.2% of world population and produce approximately 50% of the world's energy. To say it another way, our North American social structure involves a greater expenditure per capita per day than any other social mechanism of the past or present. There are no physical factors in existence which would prevent the efficient operation of this Continent on an energy basis. The only thing that does prevent it is our devotion to a shibboleth—price; and it remains to be seen

whether we shall pay for our devotion with our lives.

What is immediately before us? Steadily debt rises and employment falls. The great corporations which depended on their surplus to pay their interest and dividends in hard times are almost stripped bare. Taxes will become increasingly difficult to collect, but at the same time a dole will be necessary to stave off starvation. The tide of bankruptcies will continue to mount, the cities helpless to cope with the tax situation will drift into bankruptcy themselves. There will be debt holidays and desperate attempts for 'cheap money.' Such flounderings profit us nothing. Our old system is done for, and the nation has got to swallow the fact that the Price System is completely played out. We need look for no help from Republicans, Democrats, Socialists for each group in its own way is devoted to price also. A new system based upon a recognition and an understanding of our available energy must be devised. That is the problem before the people. It can be done. Are we going to set about it before it is too late?

# The Atomic Revolution

★ THE CONTROLLED RELEASE of atomic energy is not only the most spectacular but also the most revolutionary achievement in the history of science. Within the short span of five years a handful of scientists, standing on the shoulders of thousands of others who had been probing the heart of the atom for fifty years, uncorked a torrent of concentrated energy that can improve the world immeasurably or blot it out completely . . .

Never before in the history of man has such a colossal task been completed in so short a time. A heritage of scientific brains unsurpassed in the annals of theoretical science, a reservoir of brilliant engineering and industrial talent, a life-and-death situation that compelled planned, coordinated and accelerated action, and finally, an expenditure of \$2 billion (more money than had ever before been spent on research in pure science in this country), made this epochal achievement possible.

There is no reason in the world why similar triumphs cannot be repeated in peacetime in the battle against cancer, polio, the insanities, the chronic ailments of middle and old age, and the crushing poverty of millions throughout the world. If the miracle of Manhattan District has not taught us a lesson, we will continue to waste our potential powers, and retard the day when pain and poverty must be banished from the peoples of the earth.

—BERNARD JAFFE in *New Republic*

★ IT IS OBVIOUS that by unleashing the tremendous power locked within the atom, man has taken an enormous forward stride toward conquering the universe. For the first time we have developed a process which produces a fantastically larger amount of energy than goes into it . . .

It is not too fanciful to say that what has happened is that the sun, so to speak, has been brought down in every man's back yard. We now have man-made atomic furnaces. If the energy they produce can be controlled for constructive purposes as well as destructive ones, there is almost no limit to the possible results .

Can it be controlled? The scientists who worked on the bomb are cautious in their statements, but the consensus is that atomic energy for many sorts of useful purposes is not more than 10 to 20 years away at most.

—BRUCE BLIVEN in *Maclean's Magazine*

★ AS LONG AS people were content with the pre-uranic scientific progress . . . the few imaginative scientists who saw the possibilities of the serious and adequate utilization of science could get no hearing . . . They (people) are not going to be content any longer with leaving the realization of scientific benefits to their grandchildren . . . The new era of the atom will also be the era in which the pursuit and application of science will become a major instead of an exceptional human occupation.

—J. D. BERNAL in *The New*



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. *Encyclopedia Americana* says: 'Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Veblen (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly, full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves in to an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Technocracy's Position on Political Parties

**O**NLY *TECHNOCRACY* has the fortitude to proclaim that abundance, economic and social security cannot be dispensed to the people of Canada and the United States by any political party administration of this Price System, whether of the Left or the Right. Technocracy takes its position that those who advocate any or all of these political nostrums are in actuality counterrevolutionists seeking to delay or to sabotage the arrival of a New America of abundance. You have your choice. Join a political party for more deception or join Technocracy and face reality.

—CHQ, TECHNOCRACY INC.

(SECTION STAMP)



# TECHNOCRACY DIGEST

25c

**The Price of Prosperity!**  
**Ford Empire Played Both Sides in War**  
**Will There Be Jobs?**  
**The House That Chaos Built**  
**Technocrats Are Not Jobocrats!**  
**Canada's Chemical Industry**  
**Wood Becomes Super-Wood**  
**New Things for More People**

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# TECHNOCRACY DIGEST

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COUNTRY FOR SOCIAL CHANGE

DECEMBER, 1945

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No. 90

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# Technocrats Are Not Jobocrats!

*The present attitude of the majority of Canadians and Americans toward jobs is a result of a lifetime of conditioning in a Price System economy . . . These deluded citizens can't realize that they really want social security and abundance—not more toil.*

**R**ECENT surveys by the Gallup poll indicate that the question of jobs concerns more Americans and Canadians than any other issue today. The unemployment problem is being featured more and more prominently in our national magazines. Books such as Wallace's **Sixty Million Jobs** are achieving wide circulation. Politicians and businessmen are being asked to state their opinion on 'full employment.' Expressing the intense current interest in the subject, a new word has even been coined—'jobocracy.'

The present attitude of the majority of Canadians and Americans toward jobs is a result of a lifetime of conditioning in a Price System economy. Because consuming power in the Price System is dependent upon the wages and salaries paid for man-hours of human effort, many North Americans can be readily hoodwinked by that moralistic cliché, 'the right of a man to earn his bread in the sweat of his brow.' These

deluded citizens can't realize that they really want social security and abundance—not more toil. The virtue of toil is the morality of slaves! (The slaves who built the Pyramids for the Pharaohs had 'full employment.')

Technocrats are not 'jobocrats.' They are—and always have been—opposed to work for work's sake. They see no virtue in the sweat of human toil. They do not approve of make-work programs which use obsolete hand-tool methods in order to provide more employment. Neither do they feel that producing goods and then destroying them is a worthwhile human pursuit.

Continental Headquarters of Technocracy Inc. recently reaffirmed its position on human toil in a release entitled 'Full Employment—By Legislation' which stated in part:

'Civilization in North America has reached the glorious heights of technological mass production of physical wealth only because

there has been a continual substitution of the energy consuming device for the human mechanism, the kilowatt hour for the man-hour of human effort. As more extraneous energy is converted from more available sources, more energy consuming devices will be installed and more physical wealth will be produced. As and when the productive mechanism of this Continent increases its energy conversion and accompanying energy consuming devices, it will automatically delete more and more man-hours from the annual totals required for the production and distribution of physical wealth on this area. The United States in the years of the great depression had more unemployed in total numbers at one time than all the countries of Europe have ever known at one time. Surely it must be obvious to every North American that, if there were no energy consuming devices and no extraneous energy to operate them, the population of this Continent from the very young to the very old would all be full employed from dawn to dark to attain but a bare existence.

'The technological application of physical science to the means

whereby we live has moved man on this Continent farther and farther from the slavery of human toil. As more technology and more energy moves in, more physical wealth will be produced with the curve of human effort declining inversely to the input and conversion of extraneous energy . . .

'For over seventy centuries man has mouthed the platitude that "men must earn their living by the sweat of their brow" and its corollary "the poor will always be with us." These are but two of the many thousands of concepts that are part of the historical reflexes of civilized man. It is going to be extremely difficult and probably even psychologically disastrous for a considerable proportion of the population of this Continent when the actual realization comes home to them of what the technological impact on the social structure really means. As the conversion of extraneous energy approaches 200,000 kilogram calories per capita per day in Canada and the United States, more and more toil is relegated to oblivion, more and more man-hours are forever dispensed with in this human society in the production and distribution of



physical wealth. At or beyond 200,000 kilogram calories per capita per day, toil becomes impossible and any attempt to perpetrate it would be considered social sabotage. . . .

'The present propaganda for full employment and 60 million jobs presupposes a social mechanism on this Continent of human oil and hand tools, and the proposal is made on the basis of national charity and not as a constitutional right of the people of this Continent. This propaganda in reality is proposing a gigantic WPA in order to prevent the idle of the nation from having time on their hands to find "evil" things to do . . . .'

However, it is becoming more and more obvious that the Governments of Canada and the United States, in a desperate effort to keep the Price System operating, are going to introduce public works programs to create jobs. If and when they do, Technocracy advocates that they utilize the most up-to-date equipment possible instead of pick-and-shovel methods. Technocracy also recommends that any projects they contemplate be designed on a Continental scale as part of an integrated technological mechanism

rather than as the political abortions and business perversions of orthodox Price System 'planning.'

Technocracy points out that all public works programs can only be temporary expedients; they cannot for long save the present social system. In fact, some of them—such as hydroelectric projects—will help bring the Price System to an end even more abruptly.

The pressure of technological events will soon force the people of this Continent to discard the Price System in its entirety and install the North American Technate. When they do so, their consuming power will no longer be dependent upon their man-hours of labor. They will receive the highest standard of living in history with the least expenditure of human effort ever known. After this Continent has been reconstructed to the level of modern technological specifications, the citizens of the New America will be required to give their services to the Technate only 4 hours a day, 4 days a week, from the ages of 25 to 45. (Man-hours can be decreased further with increased technology.)

In the words of the recent CHQ

release: 'Toil, jobs, work, leisure, taxes, charity and all their conceptual associations can exist only so long as physical wealth is produced by hand tools and human effort in an economy of scarcity. To those frightened moralists of today who worry about the leisure of the masses, technology has the answer that leisure only exists when there is human toil. When the physical wealth of this

Continent is completely produced by technological equipment both toil and leisure will cease to exist. The social problems of a North America converting sufficient extraneous energy to produce and distribute an abundance will no longer have any relationship to the traditions, values and problems of any of the economies of scarcity.'

—The Editor

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★ **EVENTS ARE MOVING** faster and faster, and it is becoming more and more dangerous to permit a lag between the events themselves and the public perception of their significance. Often a generation elapses between an occurrence and the generalization of its import. Pressure groups have been able to play upon this lag in achieving their own purposes and have often managed to prolong it.

But as technology piles up its disruptive effects, and as its benefits are distributed too sparingly to the public as a whole, as the problem of distribution of goods becomes more and more serious, so it becomes more important that the public should understand its problems and use its power to solve them. It is no longer possible, if, indeed, it ever was, to trust in the eventual working out of the struggle.

—TEMPORARY NATIONAL ECONOMIC COMMITTEE

★ **THE CONCUSSION FROM THE COSMIC BOMB** was felt everywhere. Here is a physical fact which will speed history to a breakneck pace.

Men first made fire a long time ago. Men still burn themselves with it, but it has been a blessing. So with everything man makes. So with the cosmic bomb...

The cosmic bomb throws right in our faces, like a sudden close-up on the screen, the necessity we thought could be postponed a little longer, the necessity of common control of the physical basis of our life.

—THE PROTESTANT

★ **AMERICA IS SCARED.** We know that wartime prosperity is artificial. Looking into the future, we visualize the possibility of shut-down factories, bankrupt stores and 'No Help Wanted' signs.

—UNITED STATES SENATOR FROM MONTANA

★ **THE WORLD IS AIMING AT** a higher standard of living and the machine and science are working together to do their part in the process. But where it's going to lead is difficult to foretell. It is almost certain to lead to shorter working hours and retirement at much earlier ages. Well, that will be quite all right; that will be part of a higher standard of living. The big problem, of course, is to dovetail men and machines into the industrial picture to produce the least possible dislocation.

—LETHBRIDGE HERALD



# The Price of Prosperity!

*During the past quarter of a century North America has experienced prosperity and full employment only when we were either destroying goods abroad or at home, or giving them away to foreign countries. We have paid a heavy price for Price System prosperity in wasted manpower and natural resources.*

THE present propaganda for full employment and prosperity under 'free enterprise' is a reflection upon the intellect and memory of North Americans. It carries the insulting implication that the people of this Continent are incompetent to analyze or remember the economic events of the past 25 years. Technocracy tosses that insult back at its promulgators by re-examining recent social history.

The first World War changed the United States from a gangling, youthful nation to a major power in the world; from a debtor nation paying tribute to the older countries to a creditor nation holding what looked like a pretty good pat hand. The immediate aftermath of the war was a business depression. But it didn't last long, for a way out was shoved right under the noses of American businessmen. The devastated lands of Europe had no money with which to build themselves up by importing goods and machines; so why

not lend them the money? If individual businesses had had to lend the money or to sell their products on credit to European firms and hope for the best, the movement of goods might have been slower. But for the most part it was simpler than that: Uncle Sam lent the money and made a nice clean cash-and-carry deal of it. Most of the money handed out through these foreign loans was never repaid, but in the meantime American business moved forward in a grand cavalcade of 'prosperity' through the twenties.

In the fall of 1929, just when 'two cars in every garage' and 'two chickens in every pot' seemed almost within reach, the prosperity of the twenties suddenly changed to a slump that went on and on into the thirties in complete disregard of the rules for the proper conduct of depressions set forth by the apologists of 'the business cycle.' This slump was an inevitable result of the trends

that had been in operation for some time.

The kept economists of the Price System, with perhaps a natural anxiety to avoid biting the hand that feeds them, have always made as much of a mystery of this so-called depression as they could, and this they have done by building such intricate mazes of minor causes and secondary effects that the general public had neither the time nor the patience to follow them. But the outstanding cause of the long-continued depressed conditions of the decade following the stock-market crash of 1929 has always been plainly in view for anyone with some knowledge of the basic trends of the times. The major cause was the rapidly increasing use of modern technology, which enabled American industry to turn out a mounting flood of goods, while at the same time it paid out a dwindling stint of wages and salaries.

Everyone knows that the U.S. economy pulled itself part of the way out of the depression in the late thirties. This was done by a governmental manoeuvre similar to that which had enabled American business to sell to the virtually bankrupt countries of Europe,

this time called 'priming the pump.' Here again the Government supplied the purchasing power which industry was unable to dispense in large enough volume through the process of production. For a few months in the latter part of 1937 the artificial stimulation of government funds was discontinued, but the patient suffered a severe relapse and the treatment had to be renewed.

War broke out in September 1939. The U.S. was not directly involved. But war means destruction—and destruction is very important in a scarcity Price System threatened with full warehouses. In the depression years the U.S. Government had resorted to destruction, chiefly of farm products under the aegis of Secretary of Agriculture Henry A. Wallace. Slaughtering suckling pigs and pouring milk down drains, while it pleases producers and jobbers who are faced with shrinking prices, is a poor political manoeuvre since it is likely to draw much criticism from the electors and provide a political club for the opposing party in the next election, especially among a population ill-fed and ill-clothed.

War is different. In war the destruction is effected by foreign



powers, and so no blame can be attached to the home government. Also, it covers a much wider range of merchandise than any political government could possibly attempt to handle in a 'surplus disposal' program. It is easy to understand, then, why in the fall of 1939 the souls of the businessmen of North America were filled with renewed hope as the sun of 'business confidence' broke through the clouds and shed its warming glow into the board rooms and halls of the Chambers of Commerce, the Boards of Trade, the Manufacturers Associations and Rotary Clubs.

The rest is a matter of recent history which is not hard to call to mind. For two years after September 1939 the business economy of the United States continued to supply the material of war to many of the belligerents, including Japan. Then came the Pearl Harbor attack, which electrified the country into an increase of production and productive capacity beyond anything that had ever been achieved. In the face of dire emergency the output of the United States was partially integrated with that of Canada, and in the ensuing years the technological equipment of North Am-

erica produced the overwhelming preponderance of the ships, planes, tanks, trucks, guns, bombs, shells and foodstuffs comprising the materiel of war of the victorious United Nations.

Looking back over these last 25 years we find that private enterprise has taken a lot of buffeting, especially in the decade before the war. The depression years weakened the confidence of the public in the American Price System. With factories idle, farms deserted and a third of the nation living in poverty, it was hard to maintain the theme of 'machines make jobs'—and it was hard to get across the idea that the 'leaders' of the nation, in the political, commercial, professional and academic spheres, knew what they were doing or where they were leading. Those were bleak days for the would-be bringers of glad tidings of the great American business system. No clear line of propaganda was indicated; so there was nothing to do but keep plugging away on the recovery and 'return of confidence' lines.

The second World War itself provided a new line of approach in the indoctrination of the American public; for it was a war against Germany, a nation that

had been preparing for war for years before the attack on Poland. Part of the preparation had necessarily been a rigid restriction of the personal freedom of the masses of the German people and also a conditioning of the citizenry to subject their personal ambitions and desires to the needs of the state. Since the United States was at war with the Germans, what better line could be taken than one directly opposed to that of the enemy?

And so, of late years a flood of propaganda has been thrown at the public from press, radio, pulpit and political rostrum. A succession of books and pamphlets such as Eric Johnston's **America Unlimited** and Dr. Hayek's much ballyhooed book, **The Road to Serfdom**, have sought to restore public faith in the status quo, now under a new styling as 'Free Enterprise.' The latest of them, and perhaps the most publicised, coming as it does from such a high political source, is Henry A. Wallace's book, **Sixty Million Jobs**.

With a definiteness of statement amounting in a prominent politician to rashness, he says: 'This book sets forth my belief that we can attain the goal of 60 million jobs and a national income of 200

billion dollars without a "planned economy," without disastrous inflation, and without an unbalanced budget that will endanger our credit.'

The main theme is that business and the professions will go ahead in the usual scramble of conflicting interests — with 'encouragement' from the government and will employ in the process as many people as are necessary for their various operations. The government will stand ready at all times to create work enough to boost the employment up to approximately 60 million.

The emphasis throughout the book is on attaining a certain figure of employment. It is taken as self-evident that this figure of employment — 60 million jobs — will be a direct measure of the quantity of goods and services that will be produced. This is an unwarrantable assumption. You can have a hundred WPA men leaning on shovels and rolling cigarettes for a week and make very little impression on a pile of earth; and you can have a crew of half a dozen men operating an electric shovel and a few ten-ton trucks for a week and move a lot of dirt.

Sixty Million Jobs as a national



objective—as the national objective—is just another example of the topsy-turvy reasoning that politicians are continually getting tangled up in. What is Wallace's idea, anyway? Is it to produce an abundance of goods and services, or is it just to pile up a certain total of man-hours expended? What is the farmer's objective? Is it to put in 14 hours a day of indulgence in the 'dignity of human labor,' or is it to produce as much as he can from his land? What is the housewife's objective? Is it to spend 8 hours a day (or 10, or 12) with her mops and brooms and her stove, or is it to keep her house tidy and feed her family? What is a bus company's objective (from the operational not financial point of view)? Is it to keep thirty drivers sitting behind steering wheels for forty hours a week, or is it to maintain a transportation service?

Again, a national budget of \$200 billion is not in itself a measure of production or distribution. It doesn't follow that \$200 billion will accomplish twice as much as \$100 billion. The mere disbursement of money gives no clear accounting of what actually reaches the consumer, and Mr. Wallace, as Secretary of Commerce, should

know that very well.

Does Mr. Wallace remember, for instance, the construction of the Sunflower Ordnance Plant at DeSoto, Kansas (investigated by the Truman Committee)? The estimated cost of the buildings was \$56 million, but at the time of investigation it had cost \$120 million and was still not finished. The dirtmoving contract at the prevailing rate of \$1.50 a cubic yard would have cost \$375,000. But by boosting the unit price to \$2.50 a yard and resorting to cute tricks such as hauling one yard in a 5-yard truck and charging the government for five yards, the bill was boosted to \$4,625,000 for dirt-hauling alone! There were 700 'inspectors' on the job, who were paid a total of \$1,932,000. All this is documented in the **Congressional Record**, and demonstrates what can be accomplished by a vigorous show of business acumen in the way of stepping up employment and expenditure of funds, where creating jobs and spending money become aims in themselves.

Mr. Wallace says he 'believes' that 'by 1950 it will require 60 million persons at work an average of 40 hours a week to maintain the output of goods and serv-

ices to which the people are entitled.' Are we to take this seriously? Or is it just another of those pronouncements made by politicians in the hope of hitting on something that will catch the fancy of the electors? Remember Herbert Hoover's pre-depression assurances of what a resplendent era he 'believed' was in store for America under the 'sound' administration that the Republicans would provide? Remember R. B. Bennett's pre-election declarations about curing unemployment? Remember 'prosperity is just around the corner'?

The United States **can** employ 60 million people at 40 hours a week. She has been doing approximately that for about three years. The resulting flood of goods and equipment has been scattered throughout the world in a holocaust of destruction greater than any in previous history. Over \$13 billion worth of goods has been disposed of in lend-lease to Britain alone, in addition to the shipments to Russia, China, the liberated countries and even to South America. About 13 million U.S. service personnel have been maintained at home and abroad in the Armed Forces. And at home the bulk of industrial pro-

duction has been for war purposes.

But in peacetime what is to be done with the goods that the technological equipment of American factories, mines and farms turns out? The rehabilitation of the war-torn nations will help; but how long will that last? How long can the United States continue to unload mountains of food, textiles and machinery on the countries of Europe and Asia, who can hope to pay only by exporting their own products? Unfortunately for American business, Europe will not stay devastated. And also, the American people will tire of the spectacle of Uncle Sam decked out in a Santa Claus costume. Just about that time Britain will be getting under way with her 'Export or Die' program, and the European countries will be shipping goods in the rough-and-tumble competition of world markets.

Henry Wallace's book is being hailed as a great document of our times. But it is much less than that. It is a pipe dream set out before the American people as a political manoeuvre for re-election. Assuring the American people that they can have social security and prosperity in the



late forties by clinging to the same social system, the same mechanics of social operation, as they followed in the decade before the war is either a blunder in leadership or an attempt to mislead the American public. The major factor in the changing social condition of America today is the rapid increase of more efficient labor-saving devices and processes in the production and transportation of the things whereby men live. This factor Mr. Wallace passes over with only a perfunctory glance. More space is used in his book in references to and quotations from Alexander Hamilton and Lord Macaulay than is given to discussion of technological advance — which may seem purely incidental but is really significant of the archaic tendency of the Secretary of Com-

merce in his thinking on present-day problems.

The proposal of 60 million jobs at 40 hours a week in America to provide abundance and security under the existing Price System of business and political management in this day and age is merely an attempt to cling to the passing era of toil and wages. In the present advanced stage of technological production on this Continent, security and abundance can be attained only by a revolutionary change in the design of our social mechanism. In North America today it is possible to produce an abundance of all standard goods and services; and it is possible to distribute that abundance. But it can be done only by a system **designed to accomplish that distribution** as a primary objective.

—W. A. Adam

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★ THERE ARE SOME who bolster up their spirits with dreams of a 'new era of prosperity'. They talk in glowing terms of the pent-up demand in America for radios and autos and of the relief and rehabilitation needs of Europe, Africa and Asia. But even the wildest dreamers and the loudest talkers are well aware that these factors are strictly temporary. In their hearts they are desperately afraid of a brief boom that will be followed by the biggest 'bust' in world history.

—UNITED STATES SENATOR FROM MONTANA

★ I KNOW IT IS ARGUED that no other country has money enough to spend on the development of the atomic bomb, and this fact assures us the secret for a long time. It is a mistake often made in this country to measure things by the amount of money they cost. But other countries which have the materials and the men can apply them to the work of developing atomic power if they care to do so. For men and materials and the decision to use them, and not money, are all that is needed . . .

—ALBERT EINSTEIN

# Ford Empire Played Both Sides in War

*... So long as there continues to be offered a standing reward to all those who will 'gyp' society successfully ... socially objectionable activities follow as a consequence ... It is the Price System itself—the rules whereby the game is played—and not the individual human being which is at fault.*

—TECHNOCRACY STUDY COURSE

THIS is the story of the Ford empire and how it fought on both sides in World War II, helping to kill indiscriminately hundreds of thousands of Americans as well as Germans for profit.

It is not the story of the villainy of any one man or any one corporation. For the Ford empire broke no laws devised by man in anything it did; and when the whole story of American—and British and German and French—big business is fully revealed, it will probably be found that the Ford empire acted no worse than other economic empires, and quite possibly better than some.

So this is rather an indictment of a system than of a single corporation—a *laissez faire* system in which the motives of profit and property, export-import balances

and annual net earnings control.

And it is a system which must be re-evaluated not alone in the light of what has happened in Europe, but also of what may happen in Asia as we turn to the problem of Japan and her industrial giants, whose international relationships are as far-flung as the Ford empire's.

The Ford empire's dual role in the war, and particularly in the critical years immediately preceding the war which for Hitler were the years of preparation, was achieved through its ownership of 52 per cent of the stock of the Ford-Werke A. G. of Cologne, Germany, and through the presence on Ford-Werke's board of directors, until Pearl Harbor, of the late Edsel B. Ford, then president of the Ford Motor Co. of Dearborn, and Charles E. Sorenson, then vice-president of Ford and now president of Willys-Overland Motors.

I have no right to assume other

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*Reprinted from the newspaper PM by kind permission of the publisher. Victor H. Bernstein, a PM staff correspondent, gathered some of this material while on a six-month stay in Germany; he collected the rest from government and industrial sources in Washington.*



than both Edsel Ford and Sorenson always considered themselves good American patriots and, as such, bitter enemies of Hitler and all that Hitler stood for. Yet they were representatives of the American majority ownership of Ford-Werke and members of the 'German' firm's board of directors when the company management did these things:

—Approved barter deals between Ford-Werke and Ford Co. of Dearborn, negotiated first in 1937 and repeated in 1938 and 1939, which put precious stocks of American rubber and non-ferrous metals at the disposal of Hitler's growing war machine.

—Approved contracts, prior to Pearl Harbor, between Ford-Werke and Hitler's government which, by 1942, resulted in the manufacture by the former of 100,000 to 120,000 of the total of 350,000 trucks which the Wehrmacht had at its disposal in that year.

—Approved a special contract under which Ford-Werke arranged to produce vehicles of a strictly military nature for the Wehrmacht in a new plant built, in accordance with Wehrmacht demands, in the 'safe' zone of Berlin.

—Approved in April, 1939 — after six years of Hitlerism in Germany and but four months before the attack on Poland—a gift of 50,000 Reichsmarks to Hitler on the occasion of the Fuehrer's 50th birthday.

—Approved publication by Ford-Werke of a house organ which persistently sang Hitler's praises and boasted of Ford-Werke's role in Nazi Germany's war production.

—Approved a general policy which put the Ford empire's technical 'know-how' and its international sales service behind Ford-Werke, enabling the German subsidiary to increase its exports and thus save precious foreign exchange for Hitler and his financial wizard, Hjalmar Schacht.

These are the salient features of the Ford empire's international history in the years immediately preceding U.S. entry into the war. Shortly after Pearl Harbor, the Nazi alien property custodian formally took over Ford-Werke, the American members of the board of directors were ousted and Robert Schmidt, the man who had been the firm's general manager under American ownership, became its administrative custodian under Hitler law.

But while all formal relationship between the Ford Co. of Cologne and the Ford Co. of Dearborn was thus severed, the German plants built with U.S. funds and operated by men instilled with American 'know-how' continued to:

—Build 15 to 20 per cent of all the mobile units of all kinds built for the Wehrmacht in the course of the war;

—Produce motors and gears for Junkers and other aircraft;

—Produce at least 10,000 half-tracks for the German army;

—Play an immensely important role in the Wehrmacht repair shop program which sent back into battle time and time again motor units damaged by U.S. gunfire and bombing raids;

—Control and operate secretly a Cologne plant known as Arendt G.M.B.H., which in peacetime had manufactured Ford parts, as a 100 per cent munitions and armaments plant under direct arrangement with the High Command of the Wehrmacht.

Thus did Ford Co. genius transcend national boundaries, extending its beneficent influence all the way from Willow Run and River Rouge to the Rhine; and if a grateful U.S. Army and U.S. Navy

awarded banners to the Ford Co. of Dearborn for its share in the production of the B-24 and the jeep, so also had Hitler and the Wehrmacht reason to be grateful to the Ford Co. of Cologne, second largest producer in all Germany (second only to Opel, a General Motors subsidiary) of trucks for the German army.

The Ford Co.'s history in Germany properly begins in 1926, when a 100 per cent American-owned assembly factory was started in Berlin for the building of Ford cars from American-made parts. In 1929 Ford Motor Co. A.G., as the German Ford Company was then known, was reorganized and expanded, with British Ford Co. (Ford Motor Co. Ltd., Dagenham) taking over 60 per cent of the stock and the rest sold to selected German purchasers (including I. G. Farben, which bought up 15 per cent of the shares).

Two factors changed this setup. One was increasing German nationalism which fostered the slogan 'Buy German'; the second was the depression, which in Europe hit its peak between 1931 and 1934. The German Ford Co. satisfactorily solved both challenges by the end of the '30s. It



answered the 'Buy German' slogan by building a factory in Cologne and by manufacturing as many as possible of its own parts out of German raw materials. It answered the challenge of the depression by again reorganizing, with the Ford Co. of Dearborn re-assuming majority ownership and throwing the full weight of its production technique and magnificent worldwide sales force behind the new German company.

But in 1933 Hitler had come into power and inaugurated a war economy which posed a whole new set of problems. Hitler would no longer permit German industrial firms to pay for imports with money; he wanted simultaneously to save foreign exchange and he wanted to have a voice in what was imported so that he could be sure such imports would serve his preparations for war.

In other words, the German Ford Co. was in the position of having to export cars and parts in order to obtain the materials needed to build more cars and more parts. A glimpse into how this was achieved is given in the 1935 annual report of the German Ford Co.:

'Our company has also taken

considerable and active interest in that very important task of German industry, namely the development of foreign credit. Our exports increased in 1935 to approximately 1,280,000 RM and we hope to be able to increase this amount considerably in 1936. In this connection it must be remembered that, owing to the special commercial relations our Company has with an enterprise spread all over the world, we are in a different position concerning export matters than factories working exclusively in Germany. In order to help German economic interests, a number of other Ford Companies, especially the American and the English companies, have placed orders for industrial products in Germany.'

It goes without saying that the Ford Co. of Dearborn knew of this report, and as intelligent business men could read in it at least as much as you and I can read in it: to wit, an avowed declaration on the part of the German Ford Co. that it was working not only for itself and its German and American stockholders, but also quite openly for German national economy, which meant Hitler's economy, which meant for a war economy.

But this did not scare Ford Co. of Dearborn. The Emperors of the River Rouge and the Rhine watched Hitler break provision after provision of the Versailles treaty, watched him march into the Rhineland, into the Saar, into Austria, yes, even into Czechoslovakia—and continued to supply him with the export market he needed desperately, and the imports he needed even more.

The key products needed by German Ford Co. were rubber and non-ferrous metals. They were also key products needed by Hitler.

So Hitler clamped down on their use by foreign-owned automobile companies such as the Ford Co., which were still at the time turning out pleasure cars. The result, as Hitler must have known, was a mathematical certainty. German Ford Co. (this was in 1936) cabled frantically to Edsel Ford and Sorenson in Dearborn:

‘Purchase of tires in Germany ... is now entirely impossible ...’

And the cable went on to describe the situation as ‘catastrophic.’

Two representatives of the German Ford Co. followed the cable to Dearborn. The represen-

tatives sat down with Dearborn executives. The result was the first of the barter deals—that for 1937. Under its terms, Ford Co. of Dearborn undertook to supply rubber and other material (cotton, soot, etc.) to German tire manufacturers, and to accept in exchange cars and parts (particularly wheels, bearings and speedometers) produced by German Ford Co.

Ford Co. of Dearborn did not sell these German Ford Co. products on the American market, but had them shipped directly to its foreign markets, mostly in Latin America.

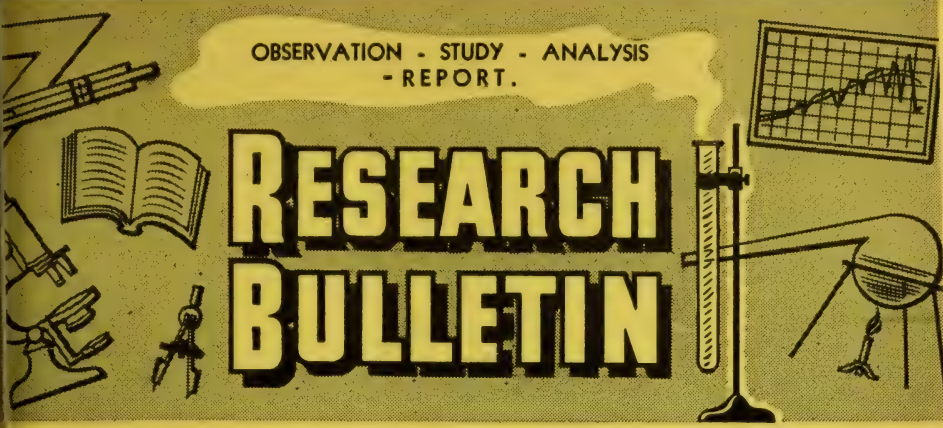
And meanwhile, back in Germany, Hitler gleefully watched raw rubber and cotton and soot unloaded for German Ford Co. at Hamburg and Bremen and other ports, and snatched 30 per cent of it for his own use—which meant that it was put at the disposal of the exclusively war-minded Nazi Ministry of Economics.

In 1938 this barter deal was repeated and extended to cover pig iron and non-ferrous metals, again with special consent of the Nazi economics ministry, which

*(Continued on Page Thirty-Five)*

TECHNOCRACY DIGEST





OBSERVATION - STUDY - ANALYSIS  
- REPORT.

# RESEARCH BULLETIN

DECEMBER, 1945

Compiled by Editorial Staff

No. 35

## *Canada's Chemical Industry*

WE overheard a very well-known scientist say on the radio the other day that while this universe is made up of countless atoms, there are less than a hundred different kinds of them. He went on to say that they are combined in nature in a large—but limited—number of different substances. Man has found out how to combine them in something like two million additional ways, forming new substances with the qualities we need, from the explosiveness of RDX to the healing ways of sulpha drugs. Nearly all these new substances have been formed for the first time in the last hundred years. Nearly all of them have been created by chemists.

These chemists are a very obliging lot. Recently, when we wanted the most devastating of weapons, they gave us the jellied gasoline incendiaries, the block-buster and flame-throwers. But they are more willing to turn their hands to the making of compounds which keep barnacles off a ship's bottom for six months after application, or to the fashioning of milady's sheerest hosiery. In short, they are in search of methods by which the natural materials that come to hand can be applied to our use with ever greater precision and satisfaction.

The chemists are the chief cooks in the confection of this host

of versatile materials. Following their detailed instructions are nearly a hundred times their number of other workers. Together these people compose the Chemical Industry. At the height of their work for the European war, in 1943, the industry in Canada employed about 93,000 people. Nearly half of these were doing jobs directly connected with munitions; they were filling shells, making small arms ammunition, depth charges, smoke floats, pyrotechnic projectiles, and so on.

But even before the war, about one industrial worker in every thirty in Canada (22,000 out of 642,000) was engaged in the making of chemical products. In 1939 these workers accounted for over one-twentieth of all our manufactured goods—\$89,000,000 worth, out of a total industrial product worth about \$1,500,000,000.

The factories they worked in, some eight hundred establishments, and the equipment they worked with, were valued at about one-twentieth the total value of all Canadian industrial plants and manufacturing equipment. Plainly this is an industry worth looking into. Its possibilities for progress seem almost boundless; a good many of us may find ourselves working within it, or in closely allied fields; we shall all be buying its wares, from teething-rings to false teeth. It refines the salt of the earth.

It is not often we remember—as we glance at this ink and paper, or set our beer down on an alcohol-proof table top, or pull out our pencil to jot down an address, or pick up the phone, or fix our gaze on an instrumental panel or the image of a movie star—that we are dealing with things of which the manufacture is largely a chemical process. We are also apt to forget, as we encounter these everyday objects, that the processes by which we get them were almost unknown in Canada a generation ago.

Building transcontinental railroads meant blasting—and lots of it—and so the period of railroad building gave the explosives industry its start in this country. World War I was the occasion for a far greater increase in chemical production.






By 1918 a great number of plants in Canada were devoted to the production of the 'staples' in the armament maker's shopping-list—still largely bulk explosives. Within four years of the end of the last war the annual production of this industry had shrunk to little more



than one-fourth the wartime level. In the late twenties it recovered some ground by converting its facilities to turn out civilian chemicals, like lacquers and cellulose products.

The depression did not hit this industry as hard as some, and by 1934 Canadian chemical production was climbing again. Not until this war has its total output returned to the levels of 1917 and 1918. In 1944 the dollar value of output was roughly four times that for 1939. It is therefore important, in our discussion of the prospects in the chemical industry, to separate its normal peacetime activities from its strictly military contribution.

## **CANADA'S CHEMICAL INDUSTRY IN PEACE AND WAR**

		1939	1943
<i>Number of plants</i>		804	945
<i>Capital employed</i>		\$213,000,000	\$760,000,000
<i>Number of employees</i>		28,000	92,000
<i>Salaries and wages</i>		\$38,000,000	\$146,000,000
<i>Net Value of product</i>		\$104,000,000	\$379,000,000

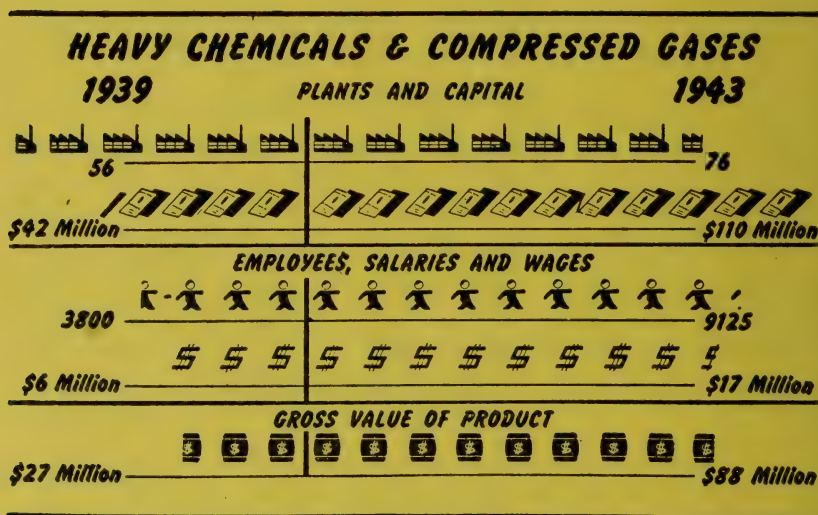
It is not very often that the ordinary man goes into a shop and asks by name for chemicals, in the way that he shops for clothes or food. The work of the chemical industry largely comes to us with other people's trade marks on it. The share of the nylon producer and the dye-maker are not so readily recognized in a pair of stockings as are, for instance, the contributions of the iron and steel industry to the buyer of an automobile. For convenience, then, we shall discuss the industry under three headings:

1. **Basic Producers of Chemicals.** The makers of acids, salts, alkalis and compressed gases in bulk quantities.

2. **Converters of Chemicals.** These industries transform the basic ingredients into the substances familiar to us in the show-windows of the druggists, stationery and hardware stores—paints, soaps, inks, plastics, etc.

3. **Consumers of Chemicals.** A host of manufacturers who use large amounts of chemicals to improve products which are mainly animal or vegetable in origin—paper, leather, rubber, fruit, meat, confections and so on.

What are Basic Chemicals?



At the very core of the whole chemical industry are the plants which produce sulphuric acid, which has been called the 'King of Chemicals.' It has been manufactured in Canada since 1867. It is basic to the processing of metals, and the manufacture of plastics, fertilizers, explosives, and high-octane gasoline, among many other materials. In peacetime, this versatile chemical tops the list for tonnage produced; in Canada, since 1939 the output of sulphuric acid has increased threefold. Production of this acid is sometimes used as a



gauge of industrial development; we may note that from 1923 to 1938 Canadian production rose from 87,000 tons to 268,000, and that in 1943 our production was proportionately at least as high as that of the United States.

Sulphuric acid was the only basic chemical made in more than one or two plants in Canada before the war; there were three in British Columbia, three in Ontario, and one in Nova Scotia. Three more plants have been built during the war: two in Quebec and one in Ontario.

Nitric and hydrochloric acids, liquids ammonia and chlorine, glycerine alcohol, metallic salts and a long list of complex ingredients for cleansing agents and plastics are the other major items in our heavy chemicals output. The basic producers also turn out compressed gases, such as acetylene, oxygen and carbon dioxide; these are used for welding, food processing and in many other ways. All these basic chemicals are derived more or less directly from natural resources like coal, metallic ore, limestone and air. Source-materials of growing importance to chemists—and abundant in Canada—are the products of the field and forest; grains, milk and wood.

## What do we mean: Chemical Converting?

### VALUE OF CHEMICALS CONSUMED BY CHEMICAL CONVERTING PLANTS

1943

<i>Paints, etc.</i>										
<i>Fertilizers</i>										
<i>Medicines, etc.</i>										
<i>Soaps, etc.</i>										
<i>Toilet Preparations</i>										

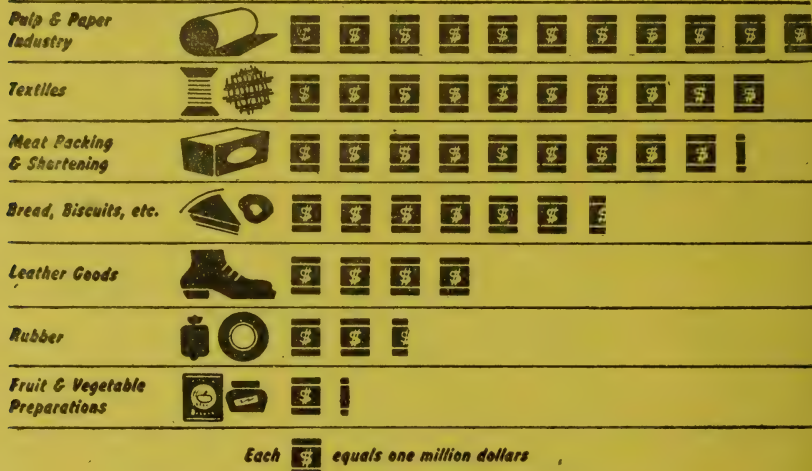
**Each  equals two million dollars**

Very few of us, from one year's end to the other, go out to buy basic chemicals (unless we invest in a storage battery filled with sulphuric acid solution). But we are all familiar with their off-spring, the secondary products of the industry. The factories making soap, paint, patent medicines, fertilizer, disinfectants and ammunition use up a great deal of heavy chemicals, as the chart shows.

The peacetime plants in this group are likely to be smaller, and to be a little more thickly populated than are the basic producing units. A comparison of the production and employment figures in chemical converting with those for the basic group will show that the valuable plants, large payrolls, better wages and more important products are to be found in the former.

Who are the main Consumers of Chemicals?

### VALUE OF CHEMICALS CONSUMED (1943) IN:



Aside from those plants which convert bulk chemicals into goods we can all use, there is another group of industries which we should mention. They are not, properly speaking, chemical industries at all; indeed some of them are worthy of examination in their own right.



But they appear at this point because they loom so large as buyers of chemical products. These they employ in the treatment of a great variety of non-chemical products, from morning papers to evening gowns. Some idea of the scale on which these manufacturers buy chemical products may be seen by a glance at their bills for the year 1943.

—Canadian Affairs, Reconstruction. Supplement No. 2

EDITOR'S NOTE: *This outline of Canada's chemical industry reveals the vast expansion which took place in the output of vital technological production during World War II. Canadians are now faced with the social challenge of how to reconvert that tremendous chemical capacity to the provision of peacetime needs. Technocracy has the answer.*

## Wood Becomes Super-Wood

SINCE man first realized that the tree is in itself one of the world's most efficient 'Factories', he has been trying in his own laboratories to discover, and to understand, the processes by which are wrought the miracle that is a tree.

In its leaves, branches, and trunk the tree combines gases, chemicals, and solar energy into products so numerous that their number may only be guessed.

Within the last two decades, not only the lumber industry, but the United States Government and laboratories outside as well as within the industry have been awakened to the value of wood research. Within that time as a nation we have become aware of the vast potentialities of our continuing forest harvest.

Much of this work has been in the chemical analysis of wood, in the study of its molecular structure and in the possibility of extracting valuable by-products from forest wastes.

Other experiments have sought and found many answers to the use of wood as an engineering material and in wood treatments to make it more enduring.

With our 36 billion board feet of lumber cut in 1943, we had as by-products 15 million tons of sawdust and mill shavings.

We know that sawdust has a great potential value for products into which it may be processed.

The first of these products is industrial alcohol—ethyl alcohol of the same quality that is now distilled from molasses and grains. Principal among the uses of industrial alcohol are solvents, munitions, and synthetic rubber.

If the entire output of sawdust could be hydrolyzed and converted, it would produce, it is claimed, more than three times our industrial alcohol output of 1941.

Not all wood waste is available for processing. But the amount that is available is enormous. One ton of dry sawdust can be readily converted into 55 to 60 gallons of 200 proof alcohol, 0.12 gallons of fuel oil, 100 pounds of feeding yeast containing 50% of protein. This is not all. There are additional by-products of 20 pounds of furfural and 600 pounds of lignin. From the same source may be obtained acetic acid, glycerine, lactic acid, butyric acid, and baking yeast.

Fundamental to many of these derivatives which will transfer manufacturing processes and products, is wood hydrolyzation.

The Scholler wood sugar process, which was technically improved by the U.S. Forest Products Laboratory and promoted by Timber Engineering Company, is based on wood hydrolysis.

In this process, containers holding several tons of sawdust are subjected to repeated percolations of dilute sulphuric acid under heat and pressure until the filtrate shows too low a percentage of sugar recovery to justify further processing.

The filtrate is neutralized with lime. The result is a solution of glucose and pentose sugars which are the basic raw materials for ethyl alcohol and feeding yeasts.

The residue, and potentially the most valuable by-product of the process, perhaps, is lignin.

Lignin is still a mystery; the nature of its molecular structure is not fully understood, though its physical properties have been studied extensively for adaptations to plastics and fuels.

From lignin, the material which is believed to be nature's adhesive for holding together the wood fibres in a tree, it is possible to extract a range of materials similar to the extractives from coal tar and



petroleum. Among them are tanning ingredients, the first wood by-product, pharmaceuticals, cosmetics and phenol.

Scientists tell us that lignin has given up only a small fraction of its secrets.

It is possible in a super-pressure bomb to concentrate into a few seconds the heat and pressure which Nature has applied for ages to convert vast forests into coal and petroleum.

Coal and petroleum once were trees, or at least heavy vegetation. In the laboratory, the chief components of all trees (cellulose and lignin) can be turned into coal and petroleum from which many of the hydro-carbon derivatives are extractable. It is reasonably conceivable that the age-long processes of Nature can be accelerated; and from the tree may come many more useful products.

Scientists have determined the nature and structure of the cellulose molecule. They have rearranged its atoms into new and important combinations. They have been able to make practical, industrial applications of the methods by which these new forms and substances have been gained. The results so far, have added important sources of food, clothing, medicines, fuel, rubber, chemicals.

Parallel advance in the lignin molecule may likewise turn to the service of man wood by-products which have been wasted, neglected or discarded.

Wood also may be impregnated with a resin or resin-forming material and pressed. This is 'compregnated wood' or 'compreg.' Usually, it is laminated. The resin-forming material may be used to supply the bond between the layers, or another adhesive may be used. The impregnated material may be compressed to a half or a third of the original thickness.

Compregnated wood was well known in Germany before it came into use in this country. But the German material differed from the materials developed by American technologists. The former method consisted of impregnating wood with a resin already formed, producing a material of high density. But it did not achieve dimensional control or stability in the wood product. The wood so produced would continue to shrink and swell.

The method developed at the U.S. Forest Products Laboratory

used water soluble, resin-forming impregnants. The molecules of the impregnating materials were so small that they could enter the cell walls, there to become a rigid resin which hindered the normal shrinkage of the wood fibre.

A recent practical development, stemming from basic research of the U.S. Forest Products Laboratory in the field of impregnating, is the 'Arboneeld' process (du Pont). 'Arboneeld' is a trade name indicating that the wood has been treated with dimethylol-urea. In this process, the wood structure is filled with resin-forming urea materials. The impregnation approaches complete fibre saturation. The process of setting the resins, known as polymerization, is accomplished by subjecting the wet-treated wood to a drying process. The water in the solution is driven off. When the wood is sufficiently dry, it may be subjected to a relatively high heating process. This causes a chemical change. The resin-forming material becomes a relatively stable thermo-setting plastic, which imparts increased hardness to the wood as well as making it resistant to shrinkage and swelling.

The material used in 'Arboneeld' is colorless. Wood treated with it need not be changed in appearance. But, the simple addition of dyes to the treating solution produces completely colored woods of any hue or shade.

The advantage of this treatment is that the chemical used is inexpensive. Dimethylol-urea treated wood is generally used without compression, and increased density is due to the infiltrated materials. However, during the heating or polymerization process, the wood becomes relatively plastic, a property which may be utilized in molding the wood to various forms and contours, or for compressing to obtain additional density. Moderate pressure and heat between highly polished platens provides a beautiful, smooth finish having considerable depth. The impregnating and compressing process alters the physical properties of wood in general. It becomes harder and denser, has increased dimensional stability. Some treatments appear to provide increased resistance to decay and insect attack. These properties can probably be utilized to broaden the scope of usefulness of the common commercial varieties, and, even of neglected species of wood.



In short, this process provides an inexpensive treated wood of great versatility.

Plywood manufacture and laminating processes have been constantly improved by research techniques. Today, glued wood, when properly designed for the purpose, is satisfactorily stable even under the most adverse conditions. The alternate layers of plywood, bonded together with high strength, water resistant glues, have provided wing material for Mosquito bombers and hulls for PT boats. Under fire of machine guns, and even larger weapons, the adhesion of the layers is so strong that they do not separate. The damage is so localized that only minor repairs are needed.

To carry heavy war-time traffic, the Great Northern Railroad constructed 1,000 freight cars of 5/8" plywood, lighter than conventional steel frames. These cars weighed two tons less than all-steel cars. Also, they permitted the operation of trains at considerably higher speeds.

An outstanding accomplishment of wood research has been made in marine wood laminating. By 'test-tube' researches in conjunction with 'pilot plant' testing, new and improved techniques in the art of boat building have been developed. Dozens of patrol boats, thousands of landing craft, and tens of thousands of lifeboat paddles—laminated from wood and bonded with water-proof glues—have performed outstanding service.

Laminating wood, like plywood manufacture, is an old process but not so well known. It differs from plywood in that the grain of the layers or plies is parallel to the adjacent layers and usually, but not necessarily, the plies are of thicker wood. Laminating is a process known and used prior to the advent of modern glues. This was accomplished by fastening the plies with nails, or sometimes, by combining nails and the imperfect glues of the time. This process did not provide a homogeneous unit.

The new glues and improved technique have made it possible to build wood members of almost any size and shape. The bonding materials if properly selected and applied will stand up in fresh or salt water. They are little affected by acids. Laminating processes make it possible to produce large size timbers dried uniformly to any

desired moisture content. They can be so designed as to provide uniform, specified strength.

The line where wood stops being wood and becomes a plastic is finely drawn.

Many of the compregnated woods and similar products may well be classified as plastics. But, the true wood plastic cannot be said to be made **of** wood, but rather it is **from** wood.

We commonly think of plastics as something ultra-modern.

The development of modern plastics actually dates back three-quarters of a century, to an attempt to find a substitute for ivory with which to make billiard balls.

The result of those experiments was Celluloid.

It is not too far-fetched to say that the plastics industry grew from a seed the size of a billiard ball.

For many years, Celluloid was made from cotton which is almost pure cellulose. But, since the paper making process has taught us to separate the cellulose from wood, Celluloid and hundreds of derivatives now are being made from wood cellulose.

Lignin, by-product of wood hydrolysis from wood sugar, also yields desirable plastics. Studies now under way indicate that it may be a potential source of many more.

Plastic turrets and bomber noses, as strong as the metal armor around the turrets and cockpits, have saved the lives of thousands of our sky-fighters. They have widened the crew's scope of vision which, in turn, has increased the deadliness of bombing and strafing.

Lignin plastics provided material for the noses and fuses of our bombs.

Instrument panels for planes, tanks, and trucks are made of plastics. They have provided cases for chronometers, field radio sets, hospital equipment, and a battalion of other items to save lives and speed victory.

Plastic lighting fixtures, bathroom fittings, and water pipes entirely of plastics are waiting only the release of plastics from the demands of war.

The future of plastics has as yet no visible limit. Their moldable features, colorable advantages, surface qualities, light weight, vari-



able opacity, and other attributes make plastics an adaptable medium for a fascinating range of uses.

Rayon is itself a form of plastic, being produced from wood pulp reduced to a jelly-like mass by the addition of chemicals and spun into threads in a machine acting on the same principle as the machine which spins candy floss at country carnivals.

Originally only a fair substitute for silk, the demands of war have stimulated research and development in rayon. Today rayon is not only a beautiful and durable fabric, but one so strong and resilient as to be used for making the cords for automobile tires, belt webbing, and other exacting industrial applications. Many of our heaviest bombers take off and land on tires made with rayon cords.

In addition to rayon, another material for clothing is being made from another 'waste' of the timber harvest. Science has found methods to transform the bark fiber of some trees, into a fiber which, when mixed with wool, makes a durable garment.

Dog-eared, frayed, almost tattered—postwar planning has become a trite thought. But a reality that is already changing not only industrial patterns and processes but commercial applications of wood—applications pertinent to many industries—is the new super wood that the chemist has created and converted, with the designer, into new usefulness . . .

—Frank Romer in *The Crown*

*EDITOR'S NOTE: This story of super-wood is a condensed version of the technological progress being made in wood research, as related in a book produced by Timber Engineering Co., Inc., Washington, D.C., an affiliate of the non-profit organization, American Forest Products Industries, Inc.*

## *New Things for More People*

**W**AR has deprived us of many accustomed things, but it has also stimulated research and invention to develop new products and new processes. The effect is manifest in every direction . . .

Synthetic ammonia and nitrates now used for explosives will enrich our impoverished soils. Fertilizers will be sprayed on the soil

in aqueous solutions instead of as solid materials depending upon rainfall for their penetration. The stimulating effect on trees and fruits of hydrocarbon gases from cracking petroleum has been demonstrated. Thus the growth rate of potato seedlings has been increased 100% by treatment with ethylene or propylene, and oranges have been ripened rapidly with the same gases. Butylene, the gaseous raw material of aviation fuel and synthetic rubber, stimulates fruit trees in districts having a short growing season. Fruits and vegetables grow to double normal size when colchicine, extracted from a crocus plant is applied to seeds, leaves, or buds. In some cases this magic substance induces entirely new varieties.

Extensive research on housing suggests that postwar dwellings will seem hardly real when compared with our present houses. Emphasis will be laid on prefabricated, low cost houses, completely air conditioned and thoroughly insulated from heat, cold and noise. New materials available for construction include plywoods, woods resinified for greater durability, highly resistant plastics, newly developed steels and light alloys. Enduring paints with hard surfaces in which dirt particles cannot become embedded are ready for postwar use. The petroleum industry is now making oils which dry more quickly than the linseed oil commonly used in paints. A new type of rubber insulation against heat and noise weighs only 1.5 pounds per cubic foot, compared with 12 pounds for cork.

Light sources, built into walls, ceilings and furniture, will produce soft and luminous radiant effects which minimize eye strain. The color of the emitted light may be changed automatically according to a prearranged schedule, or regulated to the mood of the individual. Walls may even store up light during the day and radiate it at night.

Completely insulated and polished reflecting walls will reduce losses of heat from a room so that smaller heaters will suffice. Heat may be supplied by high frequency electro-magnetic methods, or by infra-red rays. Extremely rapid cooking is reported by a method using electronic tubes and operating on the same principle as therapeutic diathermy treatments. To broil a steak requires only three seconds, and to boil eggs, less time than it takes to tell about it. Cooking of a whole meal is quite possible in only ten seconds.



Dust particles and pollens will be removed from the air by electric and magnetic devices, thus minimizing sweeping and dusting and relieving sufferers from allergies. Radiant tubes placed in refrigerators will destroy harmful bacteria. Magnesium and aluminum alloys will provide light weight ladders, lawn mowers, ironing boards and other equipment and tools.

Synthetic textiles threaten to outmode the products of the silk-worm, the sheep and the cotton plant. Fabrics are now being woven from rayon, nylon, rubber, glass, wools from wood and from soybeans, fibers from milk casein and several metals. Extremely strong light yarns and fibers having high resistance to fire and chemicals are being manufactured from synthetic plastics. Special petroleum products are used to impregnate fabrics to protect them against molds and moths. The textile industry promises pants that won't shine or lose their crease, suits that won't wrinkle even when wet, and woollens that will not shrink, with three times the wear of present types. Better leather made with better tanning agents will insure more comfortable and longer wearing footwear and many of tomorrow's shoes will contain no leather at all.

Air conditioning units are planned for tomorrow's light, efficient automobiles. The engine in the postwar car will have lower fuel consumption per mile, and the car will show greater overall efficiency and safety at increased speeds. Fifty or more miles per gallon of fuel is possible using engines designed for high octane gasoline. The design of the postwar motor car will take into account far greater safety in driving and greater visibility from all parts of the car. It will be provided with windows and windshields made from non-glaring and non-wetting glasses and plastics. With improvements in synthetic rubber, tires may give 100,000 miles of service and outlast the automobile. They will be puncture-proof, as are the bullet-sealing synthetic rubber fuel tanks now used in our airplanes, and may only need to be inflated once a year.

In postwar transportation, planes will compete sharply with automobiles, buses, trains and ships. Superplanes already ordered will be twice as large as the clippers now flying trans-oceanic routes and will carry 108 passengers and a 13 man crew. They will fly pas-

sengers from New York to Rio de Janiero in 19 hours at fares as low as 3.0 to 3.5 cents a mile; their time from San Francisco to Honolulu will be about 8 hours.

Glass fibers are spun into surgical sutures, or coated with synthetic rubber or resins which can be woven into flexible, tear resistant fabrics, especially useful in resistance to fire, acid or oil. Recently petroleum lubricated glass-hawsers, stronger than steel and proof against rot and mildew, have been used to tie up ships.

These are a few of the new things tomorrow holds for all people. Many many more are in the making. Not only does the future hold the materials of happiness, but by that very fact it will provide man with the means to acquire and enjoy them. One may approach confidently that future which science, technology and industry are preparing for the welfare and enjoyment of not just a few but all men.

—From an Address by Gustav Egloff in Chemical Digest

EDITOR'S NOTE: *The technological advances mentioned above are only a few of the advantages which can be utilized in the North American Technate. Through the fullest application of physical science to the means whereby we live, we can eliminate much drudgery and drabness and provide more comfort and convenience for all people. Of special interest in the above article is the item which deals with modern rapid cooking methods. This particular development has been publicized by Technocracy for over ten years.*

★ BLOOMINGTON, Indiana.—Debby Skinner, 13 months old, has lived since birth in a box—a mechanical baby-tender—free from almost all sound and dirt and always at the right temperature for a baby.

The baby tender is science's contribution to easing the modern mother's problems. 'Her remarkable good health and happiness and my wife's welcome leisure have exceeded our most optimistic predictions,' says the father, B. F. Skinner, recently named professor of psychology at Indiana University. He and Mrs. Skinner felt it was time to apply a little labor-saving to the problems of the nursery, and the mechanical baby tender resulted.

The first problem was how to keep the baby warm. Their answer was to heat the baby's home—so they had built an insulated box about the size of a crib. One side is safety glass which can be raised like a window. The box is heated by electricity to the temperature wanted, controlled by a safety device.

The bottom of the box is tightly stretched canvas over which there is a sheet. The clean sheet, except that part in use, is on a roll outside the crib and fresh sheet can be put in place by turning a crank in a few seconds. The sheet is 10 yards long and lasts a week.

The Skinners plan to keep Debby in the box until she is two years old, or perhaps three, extending the time out of the box as she grows older. She spends six and one-half hours a day out of the box now. Eventually she will spend only her sleeping time in it.

—CALGARY ALBERTAN



(Continued from Page Eighteen)

this time exacted for its own disposition not only 30 per cent of the rubber but also 20 per cent of the pig iron. And this 1938 deal was substantially repeated in 1939.

The special contract under which German Ford Co. undertook to manufacture a special type of military car—command cars or troop carriers—for the High Command was signed in 1938, after Sorenson visited Germany.

The contract was not signed without difficulty. It took three years to negotiate and involved a series of cables to and from Dearborn and visits of German Ford Co. men to the U.S.A. and of Dearborn Ford Co. men to Germany.

The records show that German Ford Co. was anxious for the contract, not alone for the profits involved but in order to obtain the good-will of the German High Command, which had apparently first broached the subject of building a special military car.

The records also show that Ford Co. of Dearborn was hesitant and vacillating. In the first place, the contract involved creation of a new factory in what was then considered by the German High

Command as the absolutely safe Berlin zone—safe, that is, from all possible bombing raids.

But agreement was finally reached upon Sorenson's arrival in Germany in April, 1938, and production of the military car began in 1939 in a Berlin factory. Due to lack of material and frequent changes and ultimate abandonment of the design, the factory produced only 1100 military vehicles of the type originally intended, although it also was used for a while to produce Luftwaffe items and spare parts for the Cologne factory.

The factory was closed down in 1942, after the Wehrmacht's successes in the west seemed to have rendered Cologne forever safe from attack. But copies of the contract which show American Ford Co.'s willingness to have the German Ford Co. produce military cars specifically designed by Hitler's High Command still exist.

Shortly after the outbreak of the war (but before Hitler's declaration of war against the U.S.-A.) Heinrich F. Albert, then chairman of the board of the Ford Co.'s German subsidiary, Ford-Werke A.G., prepared a memorandum defending American majority ownership of the firm as in

the interests of German national economy.

Read for the Ford Co. the name of almost any other international industrial empire and you get the real pattern and meaning of international big business and the need for its regulation.

Here are the cogent paragraphs of Albert's memorandum:

'In the past seven years, Ford-Werke A.G. has been transformed into a Germany company to an increasing extent. Not only are all vehicles and parts produced in Germany, but German workers using German materials under German direction are producing them . . .

'In this connection, all needed foreign raw materials were obtained through the American Company (rubber, non-ferrous metals) to cover not only the production needs of the German plant, but in part for the whole industry.

'Already during the peace, American influence has been more or less converted into support for the German plant. At the outbreak of war, Ford-Werke A.G. placed itself immediately at the disposal of the armed forces for armament purposes.

'Among the reasons which argue against complete Germanization

of Ford-Werke's capital, the primary one is the excellent sales organization which, thanks to its connection with the American company, is at the disposal of Ford-Werke A.G. According to their productive capacity, the German plants can export to all countries of the world, and in this they are protected and supported in the matter of pricing by the American company. In some countries this has led to making possible the German export of German Ford cars, even where the rest of the German industry was unable to find solid footing. This limits or keeps away purely American competition to some extent.

'As long as Ford-Werke A.G. has an American majority, it will be possible to bring the remaining European Ford companies under German influence, and thus to execute the greater European policy in this field, too. As soon as the American majority is eliminated, each Ford company in every country will fight for its individual existence. The just now successfully accomplished joining of the potentiality of the non-German European companies to the potentiality of Ford-Werke A.G., and with this to the general war



potentiality of Germany, would thus collapse more or less by itself.

A majority holding, even if it is only a small one, by the Americans is essential for the—actually free—transmission of the newest American models as well as for the insight into American production and sales methods. Since Americans are without doubt particularly progressive in the field, the maintenance of this connection is in the German interest. This cannot be accomplished merely through license fees or contractual stipulations. With the abolition of the American majority, this advantage as well as the importance to the company for the obtaining of raw materials

and exports would be lost. The plant would practically only be worth its own machine capacity.'

Thus the story of the Ford empire and World War II.

It is, in essence, neither a new story nor a unique story. It is, indeed, too old and too familiar for comfort. It is in itself an echo of the story of other industrial giants who played both sides of the fence before and during World War I. And it will undoubtedly be echoed in time as we learn more of the behavior of Ford's great contemporaries before and during this war.

All I can add is that after 1918 we learned much—and did nothing. —Victor H. Bernstein



★ **TWO TOP-DRAWER EXECUTIVES** of the fabulous house of Mitsubishi told me in an exclusive interview that they estimated that 80 to 90% of their industrial empire had been destroyed or damaged by American air raids . . .

When I expressed doubts to Kwanzo Tanaka, chairman, and Ichiro Hattori, managing director of the Mitsubishi Trading Co., they maintained that more raids were concentrated on their holdings than on any others in Japan.

'Whatever the correct figures may be, this destruction represents a considerable property loss not only to Japanese but to American capital. Westinghouse, for example, own 20 to 30% of the Mitsubishi Electrical Engineering Co.,' said Tanaka. And Associated Oil of California owns half of the Mitsubishi Oil Refining Co., at Yokohama, which is completely burned out, he added.

However, there is a nice pile of many million yen waiting for American investors, according to Tanaka, who declared: 'We reserved their dividends for them during the war. They can get them whenever they care to come.'

—WILLIAM MCGAFFIN in *Vancouver Daily Province*

★ **IF MANKIND HAS SENSE ENOUGH** to follow the obvious path of self-interest, atomic energy will be an amazing boon; if it doesn't—well, better buy a cave now.

—NEW REPUBLIC

# Will There Be Jobs?

*The United States is so enormously rich in productive capacity that it required both a vast domestic expansion and an equally enormous rise in foreign trade to achieve full employment during the war . . . Even spending for social improvement on a scale beyond that of the New Deal will not suffice to give us full employment of machines and men.*

—I. F. STONE

THE latest report made by John W. Snyder, Director of War Mobilization and Reconversion, touches but gingerly on the question of coming unemployment. 'By next spring,' the report says, 'with demobilization running at better than a million a month, unemployment may rise to about eight million.' The next sentence seems to imply that this will be temporary. 'The total,' the report continues, 'will depend on how fast reconversion and expansion can be accomplished.' But from the information available here we seem to be headed at the best toward chronic unemployment after reconversion: optimistic estimates add up to about 7,500,000 jobless by the end of next year; pessimistic, to 10,500,000.

As in the early '30's, business organizations are again putting

their faith in hoopla; there seems to be a feeling that full employment can be achieved if only business men will jolly one another and the country along, like good fellows at a Rotary Club get-together. The Committee for Economic Development has become a leading practitioner in the field of synthetic cheer, with Walter D. Fuller of the Curtis Publishing Company as director of optimistic statement. Yesterday, on the basis of a 'spot check' in 884 cities, the CED announced that by next fall there would be 7,000,000 to 10,000,000 more jobs available than in 1940. The basis of computation was not disclosed, but Fuller's earlier press release, of September 10, did provide some way to assess the value of the CED estimates.

'Survey Predicts Job Total 24 per cent Higher than '40 Level' was the New York Times headline on that earlier survey. It covered 100 cities and counties but did not get the same type of data from

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all of them; in 47 the figures covered both industrial and commercial employment. The survey showed the number employed in 1940, the number employed at the peak of war production, and the number expected to be employed after reconversion. In the forty-seven cities and counties giving figures on both industrial and commercial employment, the CED survey showed a rise of about 36 per cent in the number of jobs from 1940 to the war-time peak and an expected decline of about 10 per cent after reconversion. That seems to be a pretty good sample. The actual figures on nation-wide employment in industry and trade as given by the Bureau of Labor Statistics show a rise of 31 per cent from 1940 to 1944.

If we apply the percentage of decline shown in the CED findings to the actual BLS figures, we get a loss of about 2,300,000 jobs in industry and trade combined. To these 2,300,000 lay-offs we must add 1,500,000 lay-offs by government. For civilian employment in war agencies, largely arsenals and shipyards, rose from 241,000 to 2,052,000 during the war. In addition, demobilization will release 9,000,000 from the

armed services. This gives us a total of 12,800,000 looking for work. This number will be reduced, however, by the number of married women, young people, and older folk who worked during the war but will return to their homes or schools after the war. The net withdrawal from the labor market from this source is estimated at 3,000,000. This reduces the number of job seekers to 9,800,000.

Where can jobs be found for them? No great expansion in employment is visible in transportation, where the railroads have been carrying a load 25 per cent greater than that which would come to them under peace-time full employment conditions. The output of public utilities will likewise drop after the war. Increased mechanization made it possible for mining to boost output during the war, despite a decline in employment from 916,000 in 1940 to 835,000 in 1944; return to the pre-war level of employment will not make a substantial dent in joblessness. In finance, service, and the miscellaneous trades, average employment during the first six months of this year was 4,220,000, as compared with 4,310,000 in 1940; obviously not much expan-

sion is possible there. The one sizable source of new jobs is in construction, where employment fell from 1,722,000 in 1940 to 679,000 in 1944. The Federal Works Agency estimates a somewhat lower level of construction next year than in 1940, but let us assume 1,000,000 restored jobs in the building trades. That would reduce the number of jobless after reconversion to 8,800,000. If the professions absorb 100,000, if 700,000 go into business for themselves, and if 500,000 go back to the farm, we would still have 7,500,000 jobless, or about the same number we had in 1940.

The secret of our coming difficulties lies in another sentence of the Snyder report from which we quoted above. 'During the war we have increased our national output 75 per cent, and we have done so with 12,000,000 of our strongest and youngest men and women in the armed forces.' The increase in productivity is so great that even the pent-up demand to be expected in consumer durables immediately after the war will not take up the slack in employment. The automobile industry, for example, hopes for a 60 per cent increase in output over the pre-war level but ex-

pects a 40 per cent cut in jobs from the war-time peak. Thus in the automobile industry during the peak period of meeting pent-up demand there will be a big net loss in jobs. Peak employment during the war was 700,000. The post-reconversion peak is expected to be 425,000. Pent-up demand for consumer durables will not create full employment even temporarily.

Nor is there any prospect of new private capital investment large enough to do the job. Let us take as our measuring rod the generally accepted estimate that about \$40 billion of investment annually would be necessary for a \$200 billion full-employment level of national income. Peak investment during the war period came in 1941, when private and public capital outlay was \$21 billion, the highest in our history. This declined to \$14 billion in 1942 and \$7 billion in 1943. But in these years, with that capital investment, we built a whole new synthetic rubber and aviation industry. We raised aircraft output in value from a half million to \$30 billion annually. We increased shipbuilding from three-quarters of a million tons to twenty million tons annually. We boosted steel



capacity by one-third, aluminum capacity more than ten times, and turned out more machines and machine tools in four years than in the whole previous generation. After that vast splurge of expansion who is going to put new money in any quantity into shipbuilding, aircraft, steel, aluminum, radio, electronics, or petroleum—which expects to produce a billion barrels less in peace time than it did during the war? The Department of Commerce Survey of Current Business, in a recent study of Capital Outlay Plans of Business, managed, by many shaky assumptions, to forecast \$12 billion in investment next year but admitted in an aside that this estimate lumped together 'plans having varying degrees of definiteness. They range all the way from firm commitments . . . through the desirable expansion or modernization which will take place if general conditions are more or less in line with present expectations to those tentative projects which depend on technological or competitive developments.'

Some look to expanded foreign trade for full employment. But this cannot take up the gap left at home by cessation of war spend-

ing by government. The United States is so enormously rich in productive capacity that it required both a vast domestic expansion and an equally enormous rise in foreign trade to achieve full employment during the war. Exports rose to \$8 billion in 1942, \$12 billion in 1943, \$14 billion in 1944. But it took abnormal war-time imports of materials plus a huge lend-lease program to make these exports possible. In foreign trade, too, we face a sharp deflation.

Our problem is our wealth of productive capacity, our dearth of brains, our prejudice against planning. Even spending for social improvement on a scale beyond that of the New Deal will not suffice to give us full employment of machines and men. Let me offer a few figures. Against that \$40 billion of annual investment necessary for full employment, measure the fact that the whole TVA project since its beginning has cost only \$1 billion, that \$3 billion a year for fifteen years would wipe out every slum in this country. Peripheral spending to prime the pump is not adequate. The time is coming when we shall have to plan output, industry by industry, in terms of

need rather than the 'normal' hit-or-miss market of a scarcity economy. Only that way lies full employment. Only so can the Midas of nations cope with its golden touch. —I. F. Stone

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★ **DOWN IN THE COTTON FIELDS** of southern U.S. a cotton picking machine is being tried out this year, which, if it proves a success, will revolutionize cotton growing. One machine equipped with a picking device which lifts the cotton from the pod without taking too much rubbish will pick as much in eight hours as will 60 Negro cotton pickers doing the job by hand—one machine instead of 60 men. What are we going to do with the 60 men? That's the problem. It's a headache which is facing the colored people of the Southern States. But the same tendency of machine vs. man is being seen the world around. Modern roadmaking machinery including the huge bulldozers and letourneaus which have played such a great part in building airfields to defeat the enemy in the Second Great War will displace men by the hundreds of thousands in the years to come in the world's highway building program. —LETHBRIDGE HERALD

★ **THE NEW YORK CHAMBER OF COMMERCE** has approved a report which maintains that depressions are 'the price we pay for freedom.' To a few big corporations, I have found, periods of widespread unemployment are actually welcome because they provide opportunities to squeeze out or buy out smaller corporations who are unable to weather the storm. To others, depression and unemployment seem worth-while so long as they are preceded by a boom in which lush profits can be reaped and stowed away. —UNITED STATES SENATOR FROM MONTANA

★ **WINDSOR, Ont., Oct. 25.**—Civic and government officials met today to discuss an unemployment situation which they said has caused 5000 unplaced war veterans to roam Windsor streets in search of jobs. The officials, meeting in offices of Hugh C. Stratton of National Selective Service, decided to ask Ottawa for a solution to the problem they termed 'desperate.' —CANADIAN PRESS

★ **THE SYSTEM OF FREE ENTERPRISE** that has brought us wars and rumors of war; that has caused recurring depressions and technological unemployment; that produces mountains of wealth for the few and valleys of poverty for the many is given the green light in *The Road to Serfdom*. We agree that this book is a warning cry in a time of hesitation. It says to us: 'Stop, Look and Listen.' Our logic tells us that we are on the road to serfdom when prophets of profit are in the driver's seat. —O. WALTER WAGNER in *The Protestant*

★ **IF THIS COUNTRY IS SAVED** from destruction in some not-too-remote future much credit must go to the very scientists who produced the atomic bomb. Last week in Washington, before several Congressional committees dealing with atomic control, they revealed the actualities of a scientific advance more fateful in the affairs of man than the coming of steam. They also displayed a depth of political and international understanding matched by few elected representatives—least of all, alas, by the President himself. —THE NATION

★ **THE RELEASE OF ATOMIC ENERGY** has not created a new problem. It has merely made more urgent the necessity of solving an existing one. One could say that it has affected us quantitatively, not qualitatively. —ALBERT EINSTEIN



# The House That Chaos Built

*The present housing crisis is a classic illustration of the chaotic conditions which invariably abound when the necessary preventive measures are not taken and business is allowed to proceed in its customary manner to the detriment of all. Total Conscription is the solution.*

**D**O you live in Vancouver? Are you looking for a home?

If you are, you and your numerous partners in woe will not need any prompting to realize that Vancouver is experiencing a severe housing shortage. Aching feet resulting from your endless quest for shelter are sufficient testimony to assure you of this fact.

Because of the lack of designed operation and coordinated action in our national defense program, this city in company with dozens of other Canadian and American war industry centers is in the worst state of population congestion in its history—congestion which was bound to take place under wartime conditions if adequate provisions were not made to prevent it. Vancouver's close parallel with other cities renders it qualifiable for a generally applicable diagnosis and solution.

To understand the housing crisis we must go back to the Great Depression of the 1930's to study

the factors leading to the present situation. At that time there were approximately 65,000 private dwellings in Vancouver. Many of them were vacant, as a large number of people, disheartened by the depression-wrought frustrations of urban life and the inability to eke out a decent existence, had gone to the country to try their luck. Empty houses in the city were numerous and they were worth a dime a dozen. Actually, many of them were renting as lowly as \$7.00 a month!

Then came the war. This port's excellent facilities for shipbuilding were put to use to provide naval and merchant vessels. Boeing's opened three aircraft plants.

People poured back into the city, stimulated by the promise of high wages in the war plants. Vacant houses were rapidly taken up, and before long there were none left. Still the people kept coming. They left their less lucrative but no less war-essential

farms in Alberta, Saskatchewan, and even Manitoba, and rushed to the West Coast, eagerly hopeful for a slice of the large rich pie that was being dished out here.

The problem of accommodation for this flood of war-job seekers became critical. Rents and property values sky-rocketed over night. Families began doubling up in premises, but not as quickly as new people arrived. Necessity of building new quarters became apparent.

To provide accommodation for those already engaged in war industries but not yet settled in satisfactory homes, a program of temporary housing erection was instituted. This took care of many warworkers and their families, but left out in the cold all who had come to Vancouver looking for high wage jobs without success.

A number of these, with their life savings in their pockets, augmented by warworkers who had not been included in the housing scheme or were not content with the temporary structures offered them, decided to build their own homes. Immediately they ran into the problem of procuring sufficient building materials. Lumber,

plumbing fixtures, electric equipment, nails, etc., being largely converted to war needs, were placed on a high priority basis making it next to impossible for a private citizen to obtain them. Frequently homebuilders were able to obtain the materials to begin construction, only to find that the inability to get plumbing and wiring compelled them to wait interminably to finish the job.

Some, taking lessons from these experiences of others, decided to let out the job of homebuilding to contractors. The latter, on a higher priority rating than their customers, generally were not slow in taking advantage of this situation. Using the difficulty of obtaining building materials and the lack of man power as an alibi, they put a high bid on their work. By using low-grade materials and throwing them together with reckless abandon into the semblance of a house, they reaped juicy profits.

Houses built primarily for the open market by various construction firms bore the same characteristic earmarks of poor quality workmanship and material as those built by contractors for specific customers. The exorbi-



tant price tags on these inferior jobs usually doubled and frequently trebled their prewar equivalent. What were they like? A recent survey revealed that common complaints in houses less than three years old concerned sagging foundations, faulty electric wiring and plumbing that would not pass inspection, falling plaster, sticking doors. Yet they bore prices up to \$6,000. Besides these new homes, numerous old derelicts were given faceliftings and put on the market at fancy figures. For example, one house in the Grandview district of a group built all alike for \$250 each during the early years of the Great Depression was renovated and sold for \$1200, though it had greatly depreciated in actual condition.

The fact that scarcity can always demand a price increasing in direct proportion to the extent of the scarcity is amply demonstrated in the sale of such places despite poor workmanship and high prices. Of Vancouver's 67,318 private dwellings, only 87 or .001% are vacant. These vacancies may be reasonably accounted for by normal shuffling of residents from place to place. However, since most people have had

considerable difficulty in locating suitable residences, there is little tendency to move once they have become settled, hence there is slight fluctuation from this percentage at the present time.

Congestion grew steadily worse until the Dominion Government was forced to take official recognition of the situation and warn people with no essential business here to stay away. It became necessary to identify oneself as a permanent resident of the city or as one employed in essential industry in order to receive a permit to occupy any premises. This automatically excluded many of the late comers who had not arrived in time to find war work, thus requiring them to leave the city.

What will the rest—those warworkers from other parts of Canada—do now that cessation of hostilities has resulted in large scale cutbacks in war orders and manpower dismissals? That is a question that is causing sleepless nights to the authorities in charge of emergency sheltering. If a large eastward migration of ex-warworkers should take place from Vancouver, as has occurred in several U.S. Pacific Coast cities, it would tremendously ease the

housing pressure which incongruously has increased rather than decreased since V-J Day.

Vancouver is a very popular choice with prospective discharges from the Armed Forces. It has been estimated by civic authorities that about 70% of veterans coming back to this city will return to their former homes, and the balance will require new accommodation. Were the warworkers to leave, the premises they vacated would largely offset the needs of the incoming veterans.

There is not, however, the slightest assurance that such a migration will transpire at least before next spring. With the uncertainty of a probable jobless future before them, these people would rather take their chances for the winter in the temperate coastal regions than in the more extreme interior.

What hope of relief is there in this situation? Principally that all essential building materials will be released soon enough in sufficient quantities to meet local requirements. Lack of such materials, together with a declared shortage of skilled building personnel, has been the constant excuse for not adequately meeting the situation all through the war.

Both of these stipulated reasons will soon be non-existent. From all appearances, the boys who risked their lives on foreign battlefields to protect Canadian homes will have to build their own, for it is mainly within their ranks that the Government in its belated attempt to solve the problem is seeking for trained builders.

The mad rush goes on. The Emergency Shelter Registry has been deluged with pleas, requests, orders, demands and exhortations for places to live, but has had no way of fulfilling them.

We see new abodes of the type previously described bearing 'Sold' signs hardly before the paint or varnish is dry. We see the spectacle of a 'No Vacancy' sign on an English Bay apartment block in its first stages of construction. We see, also, the exclusion from premises of couples with young children, with vehemence aimed at the wives and children of men who served our country overseas. We see the accumulation of profits arising from the low grade, high cost housing racket which was never regulated by price control.

The foregoing examples of ill-planning, lack of organization, and



general confusion are classic illustrations of the chaotic conditions which invariably abound when the necessary preventive measures are not taken and business is allowed to proceed in its customary haphazard manner to the detriment of all.

That the housing shortage is not a condition confined to Vancouver is clearly indicated by the following extract from an article entitled 'Why a Housing Shortage?' in the official Dominion Government publication, **Canadian Affairs**, of April 15, 1945:

'The so-called **Curtis Report** (report of the Sub-Committee on Housing and Community Planning of the Advisory Committee on Reconstruction; The King's Printer, Ottawa, March 1944) . . . warns of an accumulated shortage, by 1946, of 500,000 dwellings not including farm houses. Now this figure 500,000 is not static. As each year goes by it will be increased by two factors: The natural increase in the population and the number of occupied houses that fall below the level of decency and should therefore be replaced. Thus if we decide, for instance, to make up the shortage by a 20-year building program we would have

to erect about 1,640,000 by 1966—a rate of 82,000 a year. 50,000 was our best previous effort—in the last year of prosperity before the crash.'

In 1940, soon after the outbreak of war, Technocracy Inc. drew up the specifications of its Total Conscription program for quick man and material-saving victory, and placed it at the disposal of the Federal Governments of both Canada and the United States. Embodying in its design all the essentials for the efficient prosecution of a total war—the Total Conscription of Men, Machines, Materiel and Money, with National Service from All and Profits to None—its adoption for the war's duration and six months thereafter would have greatly minimized and simplified the specific problem under consideration here.

Total Conscription would put all persons on the same basis of pay and service as the men in the Armed Forces and would guarantee all the essentials—food, clothing and shelter—of everyday life. Such equity would in itself have settled one of the main difficulties. The great disparity between the low incomes of agricultural workers, office and store

clerks, etc., and the high incomes offered by the more readily recognized war industries such as shipbuilding and airplane manufacturing, naturally prompted a rush to the land of big pay promise comparable to the 19th Century land rushes, regardless of the actual employment requirements of such industries.

Had incomes been equal there would not have been the inclination for farmers, for instance, to leave their farms where they were so badly needed and enter into work with which they were entirely unfamiliar. Under Total Conscription, an accurate survey of personnel requirements in the shipbuilding and airplane industries would have been made and their needs supplied by persons in non-essential activity. This would have tremendously reduced the number of people coming to this city, and hence would also have minimized the housing problem.

Recognizing that provision of shelter for personnel engaged in war work is just as essential as the war work itself, Total Conscription would have employed mass production methods for fulfilling the housing requirements of the said personnel. All neces-

sary materials would have been made readily available so that the problem of sheltering the war-workers would have been immeasurably simplified, cutting to a fraction the time taken in the current hodge-podge procedure.

It is still not too late to adopt Total Conscription methods. The program was designed to effect an orderly transition from war to peace. To provide the homes and other essentials of life to the boys returning from war, it is vital to install the only emergency measure which allows adequately for such provision by the full and unfettered use of technology.

With the adoption of Total Conscription, instead of the traditional method of individual construction, prefabricated houses can roll off the production lines with automobile-like regularity, and with the aid of a socket wrench be set up where desired within a very few hours if the ground is ready (see 'Planes Into Houses,' **Technocracy Digest**, October 1945). Chapter 22 of the **Technocracy Study Course** describes as follows the home that we might expect as technology's gift when housing construction is released from present Price System interferences: 'Instead of thousands of separ-



ate individual architects designing houses, there would be only a few basic designs, and these designs would be made by the best technical brains that could be had for the purpose. The building would be designed for use, for long life, and for minimum cost of construction and maintenance. Incorporated into the design of the house would be the design of the furniture as an integral part. The houses would not only be heated in winter, but cooled in summer, and air - conditioned throughout the year. The lighting would be indirect, and with intensity control for the best physiological effect.

'While there is a wide variety of possible materials, the fundamental conditions that must be fulfilled are abundance, low energy cost of fabrication, and high degree of heatproofing and soundproofing qualities, as well as a structural framework rendering it vibration-proof against such impacts as occur in the ordinary activities taking place inside a dwelling. In other words, one should be able to make all the noise he pleased, or do acrobatic flip-flops, in such a house without a person in the next room being able to detect it. The building

should be proof against not only the leakage of heat from inside out, or vice versa, but also completely fireproof.

'The method of heating in such a structure also would be radically different from those now employed. It is quite likely that a thermodynamic type of heating, based on essentially the same principle as our present gas flame refrigerators, would prove to be the most efficient. In this case, however, when the house is to be heated instead of cooled, the cold end of the mechanism would be placed outside the house—probably buried in the ground—and the warm end placed inside the house. The fuel, instead of being used to heat the house directly as is done now, would merely be used to operate the refrigerating mechanism which would pump heat into the house from the outside. By such a method, theoretical considerations indicate that a house can be heated at only a small fraction of the energy cost of the most efficient of the direct heating methods obtainable.

'This method of heating has the additional advantage that by changing only a few valves the system could be made to run backwards, that is, to pump heat

from the inside to the outside of buildings, and thus act as a cooling device during warm weather, which would be analogous to our refrigerator, only on a larger scale.'

Research along these lines subsequent to the writing of the **Study Course** ten years ago has resulted in still further developments to make the technologically designed and constructed house a dream home of cleanliness, comfort and convenience beyond the modern housewife's wildest hopes and imaginings.

Proof has been repeatedly given that when we use technological processes instead of age-old philosophic concepts in dealing with our physical problems, the solution crystallizes into simplicity, resulting in the greatest satisfaction to all concerned.

When are North Americans going to relegate their still-cherished scarcity concepts to the archives of time and take up the technological tools which will provide them with the highest standard of living ever known?

—Rupert N. Urquhart.

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★ **DR. IRVING LANGMUIR** of the General Electric research laboratories, told a joint hearing of military and commerce and sub-committees of the United States Senate that by 1965 or 1975 a man may press a button in one country and kill everybody in another halfway around the world.

Dr. Langmuir warned what could happen in the atomic era unless countries can get along peaceably. He said that there is no defense against the atomic bomb and no nation or group of nations can keep the secret of its manufacture for long.

—ASSOCIATED PRESS

★ **PRESSURE GROUPS** attempt to mold public opinion to accomplish their own aims, and at any given moment it seems that government is the result of a compromise between conflicting pressure groups.

—TEMPORARY NATIONAL ECONOMIC COMMITTEE

★ **HIGH PRODUCTIVITY** in the United States is made possible by widespread use of energy derived from natural resources. The United States consumes more power per capita than any other nation in the world. Heavy consumption of minerals has enabled the Nation to accomplish what human energy supplemented only by work animals, wood, and direct application of wind and falling water could never do.

—ENERGY RESOURCES COMMITTEE

★ **BAD KISSINGEN**, Germany.—A triangular 'flying wing' glider which the high school student-designers expected to exceed 850 miles an hour by adding jet power units, is being shipped to United States air force laboratories for examination.

—REUTERS



# TECHNOCRACY

## WHAT?

Technocracy is science in the social field. *Encyclopedia Americana* says: 'Whatever the future of Technocracy, one must fairly say that it is the only program of social and economic reconstruction which is in complete intellectual and technical accord with the age in which we live.'

## WHEN?

Technocracy originated in the winter of 1918-1919 when Howard Scott formed a group of scientists, engineers, and economists that became known in 1920 as the Technical Alliance—a research organization. Some of the better known names in the Technical Alliance are of interest, such as: Frederick L. Ackerman, architect; L. K. Comstock, electrical engineer; Stuart Chase, C.P.A. (now well-known writer); Bassett Jones, electrical engineer; Leland Olds, statistician (now Federal Power Commissioner); Benton Mackaye (now in the Forestry Department); Charles P. Steinmetz and Thorstein Veblen (both now dead). Howard Scott was Chief Engineer. In 1930 the group was first known as Technocracy. In 1933 it was incorporated under the laws of the state of New York as a non-profit, non-political, non-sectarian membership organization. In 1934 Howard Scott, Director-in-Chief, made his first Continental lecture tour which laid the foundations of the present Continental membership organization. Since 1934 Technocracy has grown steadily without any spectacular spurts, revivals, collapses, or rebirths. This is in spite of the fact that the press has generally 'held the lid' on Technocracy, until early in 1942 when it made the tremendous 'discovery' that Technocracy had been reborn suddenly full-fledged with all its members, headquarters, etc., in full swing!

## WHY?

Technocracy's survey of the economic situation in North America leads to the conclusion that there is in development a process of progressive social instability, that this process will continue until the instability reaches the limits of social tolerance and that there then will have to be installed on this Continent a social mechanism competent to meet the needs of its people. Technocracy finds further that the day when social operations on this Continent can be based on a method of valuation has passed, and that it is now necessary that there be applied in the social field the quantitative methods of physical science. Technocracy, therefore, proposes that the North American Continent be operated as a self-contained functional unit under technological control. This control would operate the area under a balanced-load system of production and distribution, whereunder there would be distributed purchasing power commensurate with the resources and the continuous full-load operation of the physical equipment, with the guarantee of a high standard of living, equality of income, and economic security, at a minimum of working hours, to every adult inhabitant.

## HOW?

At this stage the objectives of Technocracy are first, the education of the people of North America to a realization of the conditions behind the social crisis, and second, the organization of all those willing to investigate and interest themselves into an informed, disciplined, and functionally capable body whose knowledge and ability can be called upon to prevent chaos in North America at that time, now imminent, when the Price System can no longer be made to operate.



## Technocracy Stands Alone!

*DURING THE LAST TWELVE YEARS Technocracy as a body of thought and as an Organization has come through the greatest depression and the greatest war in history, its vision unsullied and its strategy uncompromised. It stands alone far, far from the political party seeking election to political office. As technology moves up on this Continent in the postwar years, only Technocrats and Technocracy will have the satisfaction of seeing the historic parallelism of events confirm our operating design for this Continent as the unique solution for the social problems of our people and our time.*

—CHQ, TECHNOCRACY INC.

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